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The International Journal of Orthodontia

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ST. LOUIS, MARCH, 1917

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ORIGINAL ARTICLES

SOME SUGGESTIONS AS TO PROPHYLACTIC MEASURES FOR THE ORTHODONTIST*

BY D. ARTHUR JOHNSTON, D.D.S., LOS ANGELES, CALIF.

THE orthodontist is in a position to know how much prophylaxis is neglected with children, his patients coming from a class who wish to have the best service possible.

After consulting several orthodontists on this subject, I believe I am safe in making the statement that only a small percentage are having prophylactic treatment at regular periods, or when necessary.

It is a known fact that orthodontic appliances are often placed on teeth that are in no condition to receive them.

Enamel that is rough and stained, also superficial defects, should be polished according to modern prophylactic methods. All cavities should be filled, septic teeth removed or treated, and the mouth put in a healthy condition before any appliances are placed. Deep pits and grooves of the erupting teeth should be protected by flowing oxyphosphate cement over them as soon as they are accessible. This should be done before there is any possible chance for even an etched condition of the surface. This operation should be repeated when necessary until the teeth are in occlusion, and the patient is able to take care of them.

After the appliances are in place, it is necessary to give monthly prophylactic treatment, to care for the areas especially liable to decay, such as the approximal surfaces against bands and ligatures.

With some of the new appliances, ligatures are practically eliminated. This is an important factor.

After the appliances are removed, and before the case is dismissed, the teeth should again be carefully gone over. The etched enamel caused by wire ligatures and loose bands and superficial decay should have preventive treatment.

*Read before the Pacific Coast Society of Orthodontists, Feb. 12, 1917.

We all appreciate the importance of this work, about which there has been so much said, so many articles written in the past ten years, and so little accomplished.

If it is impossible to have the cooperation of the dentist who refers the patient, to do the prophylactic work, I suggest that the orthodontist or his assistant take care of these cases.

The following is a modified technic for the orthodontist:

One of the first steps is the removal of loose matter from between the teeth with the floss silk. Care must be taken to remove all deposits underneath the free margin of the gums.

Roughened enamel and superficial decay is made smooth with fine carborundum and Arkansas stones, following up with fine garnet disks about No. 6-0 and fine cuttle fish, using vaseline on the disks and water on the stones.

Sensitive spots and superficial decay may be touched up with silver nitrate saturated solution. I have had the best results by drying the surfaces and rubbing in the solution with the wood points.

If there are any synthetic or porcelain fillings, they should be protected with wax.

The disclosing solution, the formula of which is iodine crystals, 50 gr.; potassium iodide, 15 gr.; zinc iodide, 15 gr.; glycerine, 4 dr.; aqua distillate, 4 dr., is applied to the crowns of the teeth and will show up the plaques, if any are left after treatment. This solution is also good for inflamed gum tissue.

The next step consists in the use of the dental tape run through moistened (Dr. D. D. Smith's) flour of pumice which is carried to the approximal surfaces of the teeth. If any point between the teeth is inaccessible, the teeth should be wedged apart. The mouth should be washed out with warm water from a syringe, and the entire oral cavity sprayed, as this leaves a freshness which patients appreciate. With children it is a good plan to use a mouth wash that is pleasant to the taste.

It is extremely necessary that patients be instructed in regard to home treatment and the proper way to use the brush. Every patient should have a water syringe (S. S. White & Company's Chip Syringe No. 27 S), and the nurse or mother be shown how to use it in irrigating around the appliances when the toilet of the mouth is made, before retiring at night.

MOUTH WASHES, PASTES, AND POWDERS.

The late Dr. G. V. Black says (in substance) when the gingivæ are sore and inflamed, after removing the local cause, physiological salt solution should be used in the syringe instead of plain water until the soreness is passed. This should be done in a thorough manner. (No antiseptics of any kind should be used.) Dr. Black believed that mouth washes, pastes, and powders were of very little or no value. If there is no diseased tissue, they are not indicated. If there is any merit in antiseptic mouth washes, their effect is but of a few minutes' duration.

Some children, and possibly many adults, may be induced to take better care of their mouths if a pleasant tasting mouth wash or powder or paste is prescribed. The most of these preparations are harmless, although some are injurious.

DIET.

If you have the cooperation of the parents, some good results may be obtained by the diet of your patients. There can be no dispute over the fact that most of our dental disorders are affected by what we eat and how we eat it. The carbohydrate diet, such as pastry, fresh bread, syrups, and the washing down of food with liquids, is no doubt injurious to the teeth.

Nature fails to support anything that is unnecessary, and people who live on such a diet do not need teeth and will not have them long.

The teeth must have vigorous use and the oral tissues a certain amount of massage in order to maintain health.

The action of hard foods in chewing is nature's way of cleaning and polishing the teeth and massaging the gums. In this way a normal flow of saliva is produced, and performs its proper function.

Pickerill and others have stated that a carefully selected diet will help to make the mouth self-cleansing. Dr. J. Sim Wallace, in his work on "The Prevention of Dental Caries" says: "The diet should contain a sufficiency of solid food of a consistence which will insure a thorough cleansing of the teeth by the food, and stimulate the pleasurable activity of efficient mastication so as to prevent the child acquiring the habit of bolting its food." He believes the meal should not terminate with concentrated and easily fermentable carbohydrates which lodge or stick about the teeth. If these things are eaten, they must be followed with fresh fruit that will clean the mouth. Of all fruits for this purpose apples are the best.

The time will come when public health boards will demand cleanliness in the selection and serving of foods, and foods that contribute to the health and strength of the nation will have the preference.

No medical treatment, systemic or local, has been discovered as a universal remedy for the removal of oral accumulations or for the cure of mouth diseases.

The surgical removal only of deposits, and the polishing, brushing, and massage by the dentist at stated intervals, and by the patients daily, are the only practical methods.

The necessity of the cleaning of the teeth was practiced by the Egyptians three thousand years before Christ as an aid to beauty and as a prophylactic measure.

The ancient Hindus, Chinese, Greeks, and Romans knew the value of mouth hygiene. To them a clean mouth was an indication of culture and health as it is today.

In conclusion, I feel that orthodontia as well as the specialty of dentistry I represent, deals essentially with prophylaxis. With you the thing of foremost importance in dealing with young children is to prevent malocclusion of the teeth—believing that prevention is so much better than cure, likewise in the course of your treatment of dental irregularities, you desire to prevent dental caries, and mouth infection. In this latter, the interest of the specialist in prophylaxis and the orthodontist is almost identical. I trust our work directed to a common end as suggested, shall become increasingly interesting as time goes on.

DISCUSSION.

Dr. Engstrom.—Mr. President and members, I wish to thank Dr. Johnston for his splendid paper. I think we have all enjoyed it very much. The question of prophylaxis is of great interest to the orthodontists. The presentation of this paper by Dr. Johnston, as well as other papers by members of the profession, I think is perfectly proper, and our discussion of these questions together should be of mutual advantage to the different specialties of dentistry represented; and conditions with which each has to deal will be better understood.

In orthodontic treatment, no doubt, we interfere with normal function, and that has a great deal to do with the uncleanly condition of the mouth and the difficulty of keeping it in a hygienic condition. It is not always the fault of the operator. I lay more stress upon the interference with proper function of the tissues. Consequently, we have to resort to artificial means to overcome this defect. As Dr. Dunn has stated, he has noticed that the inflammation of gum tissue during treatment has readily subsided after the removal of appliances, showing, I think, interference with normal function, and restoration to normal function; i.e., restoration after the natural cleansing of the teeth has been resumed. I leave the rest of the discussion to the members.

Dr. Cavanagh.—I think our papers this afternoon are following very logically and in their natural sequence. Our work, as I mentioned before, is very largely referred work, and in our treatment we should remember there is another specialty in dentistry—that of prophylaxis. To what extent are we entitled to follow prophylactic treatment without intruding on the field of those who practice prophylaxis? Is it wise to have in our own offices some one who is practicing this work exclusively? That is an admirable arrangement, but we must expect where we have some one doing that work in our offices, the specialists in prophylaxis are not going to be very ready to recommend patients to us. Should we therefore just do our own work and refer patients back to the prophylaxis expert for the care they very often need? Also, to what extent are we to undertake prophylactic work when the patients are under our care, when they are sent to us from offices who engage assistants whose duty it is to take care of patients in this manner? There is an ethical question which must be considered.

Dr. Solley.—A question has occurred to me as to prophylaxis. I think many times a great amount of care due our patients is necessitated through the complexity of our appliances, as we are going on now from day to day. That is one side of our work needing attention. Rather than simplicity, our appliances seem to be running into complexity more and more. If we could turn around and take stock of ourselves, and see wherein the best possible appliances properly adapted to each individual case, could be used, I think we would do well. I feel we are running away with ourselves in this matter of appliances and doing our patients great harm from a prophylactic standpoint in many instances.

Dr. Dunn.—I think Dr. Johnston's suggestions as to the thorough cleaning and polishing of the teeth before we proceed with our operations, or the placing of appliances, are splendid, i. e., that we either do this work in our own offices or see that it is done by the man who refers the case to us. Then, during the period of our treatment, we are to give our personal attention to this work, and at the time we change our appliances, if we have special prophylactic attention given the patient by an expert, I think we would cover the field very thoroughly. That has been my experience in one or two cases in connection with a prophylaxis specialist in the city, and I have found with children especially indifferent to the care of the teeth, that the results have been most gratifying, indeed. The teeth were thoroughly gone over by this specialist. All the surfaces were thoroughly polished and kept in good condition in our own office, and when the regulating appliances were removed and the case was ready for retention, the patient was referred back for prophylactic attention with especially good results. This plan also stimulated in these children the greater desire to keep the teeth clean, after they had been to this oral prophylaxis man. They concluded it was easier to keep the teeth clean themselves than to have this course of treatment. Not that it was severe, but they did not seem to like to spend the necessary time to have their teeth cleaned.

Dr. Hampton.—Mr. President and members of the Society: Prophylaxis has been a hobby of mine for twenty-five years and it has been a problem that I have tried to solve. I have been all over the country and have studied the matter. While in a city I was with a man who makes a specialty of that, and he is able to take care of the children's work remarkably rapidly I think. He has a specialist in his office. I asked the Board there if it

would be possible to get a dental nurse. They said in that state it was not. She could not go into an office and practice prophylaxis without being a graduate and having a certificate from the Board. I brought it up before our Board in Montana, of which I am a member. They stated they would like to allow it but did not think it right as it would open the gate for others. So you cannot get a trained nurse for the office unless you get one with a certificate from the State Board, and who is especially fitted for that work. In the city it seems to me you orthodontists could send patients to a specialist in prophylaxis, or have a nurse who has taken a special course in your office to take care of your patients while wearing the appliances, and after that period they can be referred to the specialist.

I think prophylaxis is one of the greatest things we have before us.

Now Dr. Endelman has spoken of the bands,—never having seen a healthy gingiva around bands. They are very scarce. I think I have seen possibly seven per cent around gold crowns. I do not say they are all bad, but I do know that with a proper fitting band and crown, and with proper prophylaxis, one can maintain very much better conditions than without prophylaxis. So we have to combine them all, as I do in a small community. However, it seems to me, whether the patients are referred to a prophylaxis man or not, it would be better to attend to them in the office, and when they leave, refer them to a prophylaxis expert.

Dr. Dunn.—If we interpret our law as it reads, it would not permit an assistant in the office to touch a tooth in any way. Thus we are all violating this law every day. I am violating the law every day, I am sure. To my belief, the law should be amended. I would like to see any man who is doing the right thing by his patients, who is not violating the law.

Dr. Hampton.—Then it is our duty to get different laws. It is as they said to me,—if you permit one then you have to permit others.

Dr. Dunn.—Then we must amend our laws. There are a great many laws that are violated in all walks of life: for instance, the speed laws with reference to automobiles. This care of the teeth in orthodontic practice is a serious thing. The children must be given attention every time they come in the office, whether they are careful or not. Can we employ a person to whom we pay \$150 or \$200 a month to do that work? How many of us can do it?

Dr. McCoy.—I think Dr. Hampton is correct in his interpretation of the law, but I believe where we may not be able to carry on oral prophylaxis in our offices under ideal circumstances, the nurse can be employed if done diplomatically, with larger benefits to our patients. They could not perform the real prophylaxis such as Dr. Johnston and others are doing, and such as we would have done prior to beginning treatment and perhaps before the retainers go on, as Dr. Dunn suggests; but the monthly or bimonthly cleanings could be done by the nurse under the orthodontist's direction as the orthodontist could show the parent how to brush the child's teeth, for instance. If diplomatically done, I think nobody would be given any trouble.

Dr. Dunn.—According to the letter of the law, a mother really could not take a tooth brush and brush a child's teeth.

Dr. Cavanagh.—In Portland they tried to prosecute a man for allowing his assistant to polish and clean the teeth of his patients. The court made the statement that it was all folly,—that if he had the right to brush his own teeth he had an equal right to let any one else do it. If I can brush my teeth myself, and if I trust you (whether you have a diploma or not) to brush my teeth, have I not the right to allow you to do it? That was the legal view of it and the case was dismissed.

Dr. Hampton.—I would like to have an assistant in my office, and agree with you, but according to the law, those men using nonlicensed men in their offices are subject to prosecution just as the nonlicensed men are themselves.

Dr. Solley.—I think one point I made has been overlooked, that is, the matter of the nurse; what I wanted to bring out was to legalize your dental nurse. There would have to be in our colleges probably a year's course just for that sort of work, and legalize her to do it. I think gradually that is the way the thing is going to work out.

Dr. Hampton.—The only trouble is that with you it is all right, but there is a man across the street who is not so conscientious, and with him it may not be all right.

Dr. Ketcham.—You are familiar with the Fones School for the training of dental hygienists or nurses to do cleaning of the teeth of children in public schools in Connecticut,

and which also trains dental assistants. The law has been so amended that it permits these dental nurses to do this prophylactic work. It seems to me the law can be very plainly read, "prophylaxis or the cleaning of teeth," and be so written or interpreted that it would not include other work.

Dr. Cavanagh.—Then Dr. Ketcham would have to be able to differentiate between prophylaxis without a diseased condition, and the treatment of disease with prophylaxis when it involved the loss of the peridental membrane and the absorption of the alveolar process. There is no way to draw the line. The treatment naturally is a very intricate operation, requiring intimate knowledge of the investing membranes of the teeth, and anatomy, and histology. There is no place to stop.

Dr. Ketcham.—Stop with the children.

Dr. Cavanagh.—I have seen children with fairly well developed cases of pyorrhea at six and seven years of age.

Dr. Engstrom.—It appears to me we have to do prophylactic work ourselves, or have a nurse do it in our offices. Undoubtedly the means given to us in the paper is quite efficient for ordinary cases; and if properly followed out by the patients, would keep the mouth in very good condition. The thought expressed by Dr. Solley of the patient not being able financially to pay for the services of the prophylactic specialist, is interesting. I feel that telling them they will be referred to the specialist in prophylaxis will, in itself, be an incentive to the child to keep the mouth in a proper condition.

Dr. Johnston.—Who shall do this prophylactic work is an important question. There is so much of it to do I think it will not be long until the general practitioner who is trying to do everything according to the most approved methods, will have somebody in the office to do this work. Whether it will be a dental nurse, properly trained in the schools, or whether some other method will be worked out, is still to be determined.

If the dentists referring the patient to the orthodontist, would only put in an hour or two on that case, grinding and polishing the teeth and taking care of the few areas needing special attention, it seems to me after the appliances are in place, your assistant would be able to polish and give the regular prophylactic treatment, say once a month. It would require fifteen or twenty minutes' time, but you could add a charge for this time to the fee you make the patient. Certainly it is just as necessary to take care of the patient in this regard as in any other, and when your work is completed, if the teeth are not in good condition, the families whom you serve will be willing to pay for the few hours of prophylactic work that is required.

Like root canal work, if too busy to do it, we must demand better compensation for our time so that we may find the work worth while.

In regard to pyorrhea in patients of six or seven years of age, I have never seen a case of pyorrhea at that age, but I saw a case at the College a year or two ago in a boy of fifteen years of age who had lost most of his teeth. Dr. Hartzell showed a case on the screen at the Panama Pacific Dental Congress of a girl twelve years, I think, who had lost all her teeth from pyorrhea. No reason could be given for it. No doubt there had been cases of inflamed gum tissue where the teeth are lost.

I thank those who have so kindly discussed the paper.

A QUICKLY ADJUSTABLE FRACTURE BAND AND ITS POSSIBILITIES IN WAR DENTAL SURGERY

BY HERBERT A. PULLEN, D.M.D., BUFFALO, N. Y.

IN reviewing the emergencies of war dental surgery as presented to us in the hospital work of the dentists in the European Ambulance Hospitals, it has occurred to the writer that the operations in many of the cases of jaw restoration were unavoidably delayed for many days and some for several weeks before they fell into the able hands of the dental surgeons of the various hospitals for treatment.

This delay, because of the necessarily slow transportation to certain base hospitals situated some distance from the front, and also because of the necessity of first treating more serious injuries of the wounded soldiers, allows of a certain amount of healing of the tissues in abnormal approximation as in the cases of fractured jaws with displaced sections.

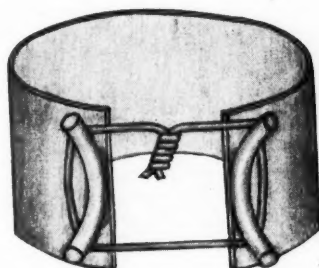


Fig. 1.

These abnormal attachments have to be forcibly broken up, and the displaced sections of the fractured jaws replaced in their normal relations by heroic methods or by the slower movement of the jackscrew.

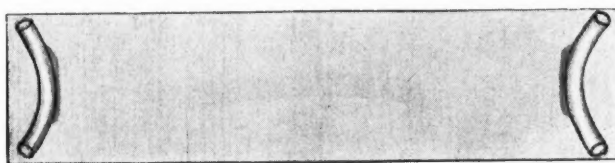


Fig. 2.

While understanding perfectly the necessity for these delays, it has seemed to the writer that if some of these cases could receive early temporary attention in the way of a hasty restoration of the sections of a fractured jaw by means of a simple and quickly adjusted apparatus, much of the later heroic restorations would be avoided and much less suffering would ensue.

What is apparently needed is a quickly and easily adjustable fracture band, adaptable to any of the teeth in the upper or lower arch, and to which suitable ligation may be made to temporarily retain the displaced sections of a fracture

so that the healing process may begin as early as possible after the wound has been received, provided the possibilities of sepsis are also taken care of.

Wiring of the teeth without the use of fracture bands, while effectual in some cases, is not as direct and positive as is the use of fracture bands applied to firm teeth situated a little distance from the line of fracture.

Granted, then, that the tightly adjustable band is preferable to the plain wiring of the teeth in these cases, the writer wishes to present a new form of

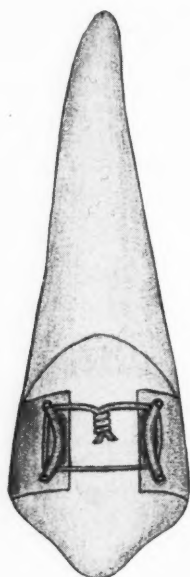


Fig. 3.

adjustable fracture band, (Fig. 1) which is more quickly adjusted than the fracture clamp band, not requiring a wrench for its adjustment, but the simple twisting of a heavy silver or brass wire around the curved horns on either end of the band.

It consists of a German silver band (Fig. 2) which has soldered across each end a short curved section of heavy German silver wire, which, by reason



Fig. 4.

of the projecting horns thus formed, is readily ligated on the labial or buccal surface of a tooth, being thus quickly adjusted and adapted.

A further advantage in its application lies in the fact that the band automatically conforms to the narrow neck of a tooth by the twisting of the labial ligaturē, as shown in Fig. 3, as the force is exerted in parallel lines across the horns, and continues to tighten the gingival edge of the band after it has already

become tight at the coronal edge, thus giving it additional support, and preventing the band from slipping off under a strain from ligatures attached from it to teeth in the opposite jaw.

By reason of its being quickly adjusted to the teeth, the use of this form of band might be of service in field and base hospitals in war time, in cases of gunshot fractures of the mandible or maxilla. Bands of this form on opposite sides of the mouth may also be quickly joined together by a section of a heavy wire solder (soft solder) as shown in Fig. 4, and the two halves of the mandible held in their proper positions in cases where the front section of the mandible has been shot away.

The wire solder may be quickly and forcibly bent with the fingers to any desired width so as to accommodate displaced fragments of a fracture, and yet will have enough stability to preserve its shape under considerable stress. A number of attachments of the wire solder may be made to individual bands upon several teeth in the arch to give added support.

Also a smooth rounded section of metal may be attached anteriorly to the wire solder to form a smooth surface for the work of the plastic surgeon in reforming the lower lip over this form.

If the teeth selected for banding in a fractured jaw are very tight together, it is an easy matter to separate them overnight sufficiently to secure plenty of space between the teeth for bands to be slipped on selected teeth by using the method of the orthodontist in separating teeth in the placing of silk or wire ligatures in the interproximate spaces on each side of the tooth to be banded.

Many other combinations in the use of this quickly adjustable band will suggest themselves to the dental surgeon in field or base hospital service where, especially, the quick fixation of fractures and the starting of the healing processes with the fractured portions in their normal relations precludes the necessity of the later breaking up of cicatricial tissues formed by the delay in treatment and the consequent displacement of fragments of the fractured bone. The injured jaws, being thus more quickly healed in their normal relations, the patient is very much more comfortable and the results of facial deformity are averted to a considerable degree.

MULTI-VIEW-ORTHO-PHOTOGRAPHY

BY RUDOLPH L. HANAU,

Consulting Dental Engineer, New York City.

DURING the discussion of my paper before the 1916 meeting of the American Society of Orthodontists in Pittsburgh, the possibility of making multi-view photographs by means of reflecting mirrors suggested itself.

During the last twelve months of my practice, in aligning engineering with practical orthodontia, I have used the camera to a great extent. In the preparation of the paper for the Pittsburgh meeting, which, I regret, has not yet reached its turn for publication in the Society's organ, I made photographs of models, and whenever more than one projection was required, as many pictures had to be taken and afterwards aligned.

It must be remembered that photographs showing more than one view of

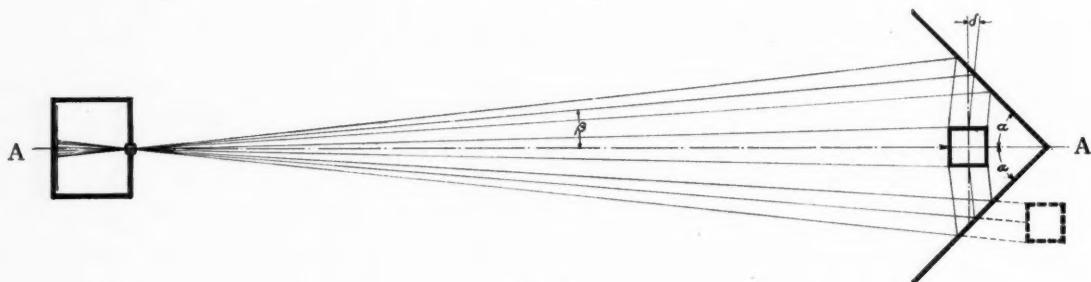


Fig. 1.

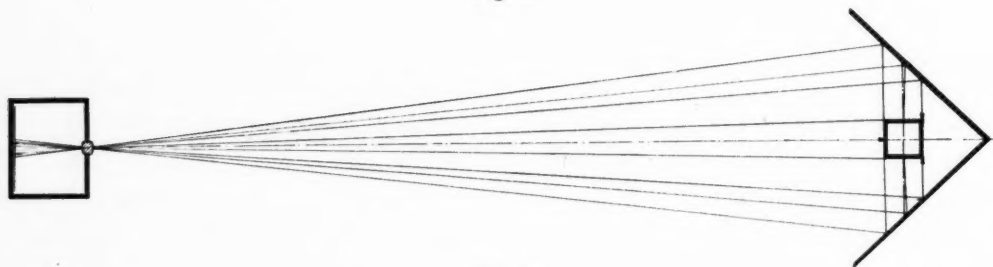


Fig. 2.

an object are not novel. They have been used to a great extent in advertising and catalogue work as well as in novel portraiture.

The possibilities of application of multi-view photography in orthodontia are obvious and almost limitless. Even ordinary photography has not been employed by many orthodontists to as large an extent as is possible. Quite often an object may be analyzed with considerably more facility from two or more projections than from the actual object. The advantages of photographs embodying front, right and left side views, and if necessary plan views of models or patients, over ordinary photographs, for purposes of diagnosis and record, are apparent. The elements of the technic will be discussed in the following paragraphs.

Fig. 1 illustrates the elementary principles involved. The reflecting mir-

(Copyright, 1917, by Rudolph L. Hanau.)

rors are set at 45 degrees to the main axis A-A ($\alpha=45^\circ$). That the profile views will be distorted will be evident on inspection of the diagram. It will be noted no part of the profile view is a 90 degree projection of the front view.

Since all reflecting rays converge to the common focus about the center of the camera lens, they cannot be parallel, and hence the closest to a right angle projection that we can approach with mirrors set 45° to the main axis A-A ($\alpha=45^\circ$) is at an angle of $90^\circ+d$. It is interesting to note that if the camera were

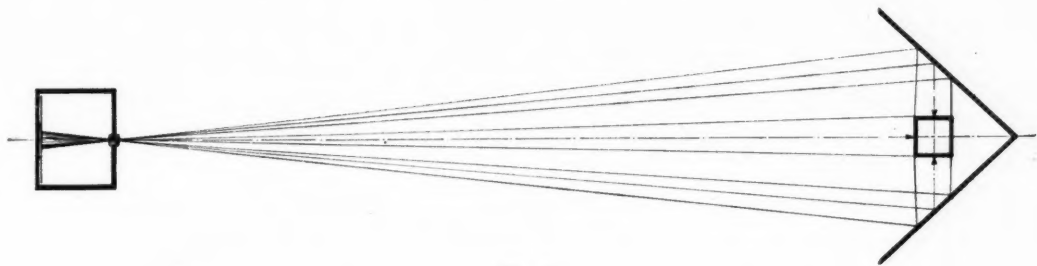


Fig. 3.

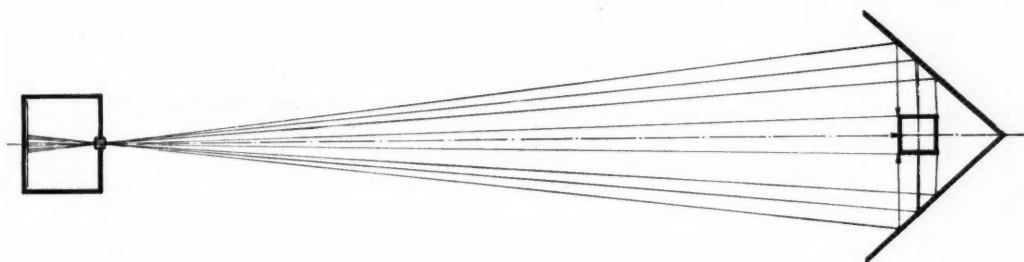


Fig. 4.

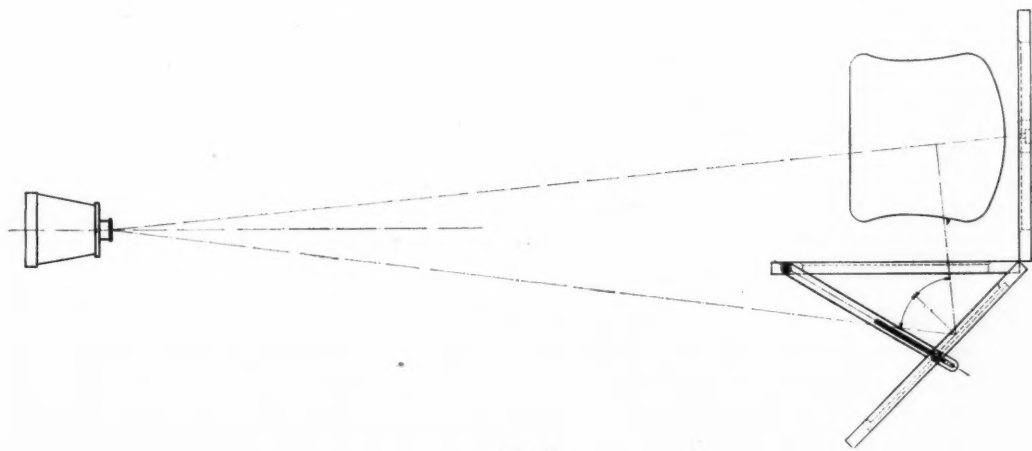


Fig. 5.

sufficiently removed from the object, d , and relatively B would be negligibly small and the projection would be practically without error. However, this cannot be accomplished with facility as the image would either be entirely too small, or special apparatus would have to be employed.

It will also be evident from the geometrical construction of Fig. 1 that since the reflected image is in back of the mirror, it will be further from the camera and consequently smaller than the direct view, on the photograph of the plate. This error is also practically negligible if the camera is far from the object; i. e.,

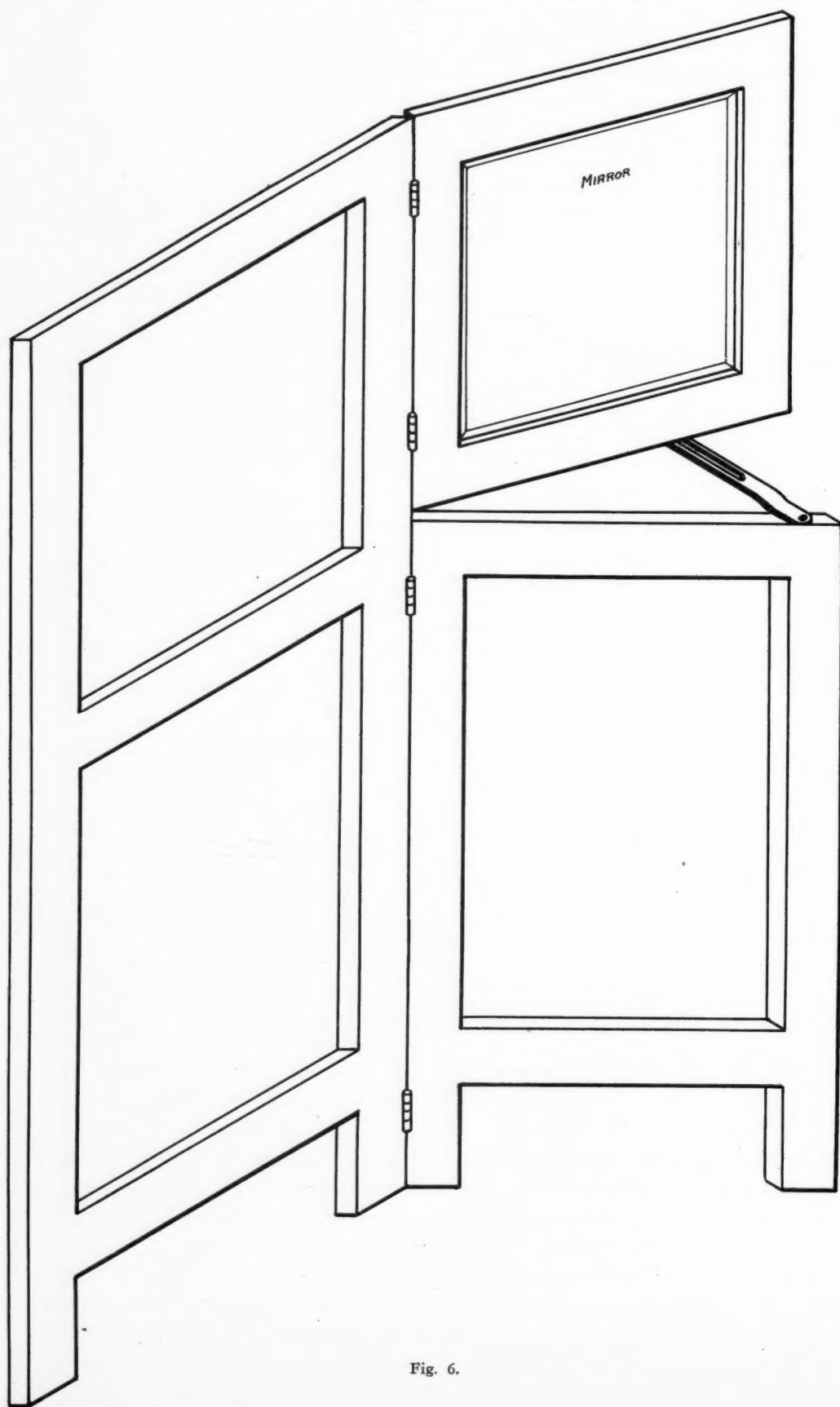


Fig. 6.

the percentage of error becomes less as the distance of the camera from the object becomes greater.

If it is desired to make corrections for this error, the object should be photographed in a scaled coordinate system, and each view compared with its respective scale.

Fig. 2 shows the object in the same position with respect to the camera, but the mirrors have been moved closer together, making the angle a smaller.

As this is done, it will be noted that the incident rays change their direction counter-clockwise. A point is then reached where the rays from one extreme of the object will be at right angles with the axis A-A.

In such a picture only the extreme of the end-projection would be undistorted. As the angle a is made still smaller the position of the perpendicular ray continues to advance.

It will be noted that a perpendicular projection is obtained either by making the angle B approach zero and hence negligible, or if the mirror is moved closer in, as has been done, the projection will also be perpendicular for a particular point on the object.

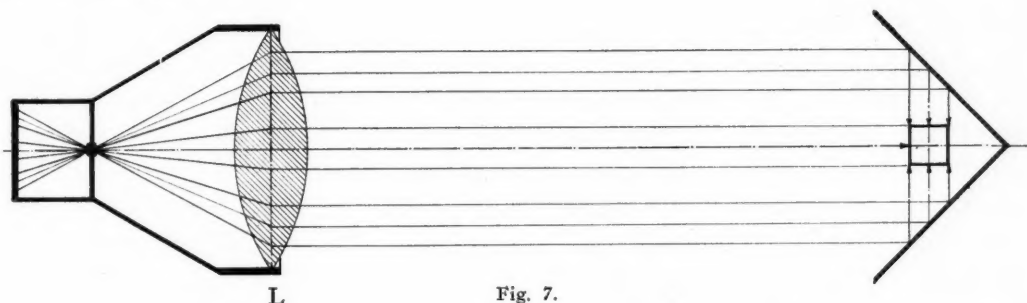


Fig. 7.

In Fig. 3 the center of the image is a true right angle projection, and in Fig. 4 the position has advanced to the other extreme of the object. If the angle a were still further diminished, the image as a projection would again be entirely distorted.

For the usual uses of photographs by the orthodontist the distortions due to perspective are negligible. The purpose of the above demonstration was rather to call the attention to those who employ photographs to the limit of their accuracy. The multi-photo reflector designed by the author is illustrated in Figs. 5 and 6. The manipulation is evident. The mirror may be adjusted to any desired angle, and the device is collapsible to occupy little space when not in use. Glass mirrors introduce many disturbances, increasing with the thickness of the glass, particularly that due to the reflection from the surface of the glass. The best results will be obtained with polished-metal mirrors.

Ordinary photographs cannot be used for precise work by the orthodontist without correction involving considerable mathematics. This procedure is obviously objectionable, and the author at first resorted to scale drawings which were soon superseded by mechanical surveys using the Stanton-Hanau Surveying Apparatus. This method was soon superseded by the ortho-photographic apparatus.

The principle of this device is illustrated in Fig. 7. It consists essentially of

an additional combination of lenses, represented by L, with a camera. The focus of this lens combination must coincide with the center of the camera lens.

It will be evident from the diagram that the reflecting rays to this lens will be parallel, and consequently all errors due to perspective are eliminated. With this device it is possible to make photographs that are entirely free from error, excepting that due to spherical aberration which also may be eliminated by the proper lenses. The main view as well as any reflected views are true 90° projections, such as are commonly used in engineering.

It must be remembered that in an image the right and left of the object are transposed, and the apparent confusion of the right view image with the left view image must be avoided.

THE HISTORY OF ORTHODONTIA

BY BERNHARD WOLF WEINBERGER, D.D.S., NEW YORK CITY.

(Continued from page 59.)

A. F. TALMA, in 1853, contributes in the *Dental News Letter* the following: "As a general thing, the irregularity of one tooth causes that of several others in the same arch and likewise in the opposite jaw. Thus, an incisor inverted or everted, or merely twisted on its axis, will cause its neighbor to incline towards it in an opposite position and thus the deformity may affect all the front teeth. On the other part, the corresponding teeth of the opposite jaw, being subjected to abnormal pressure during mastication and the occlusion of the mouth, depart almost necessarily from their regular position. From this ensemble of influences result combinations varying ad infinitum, all assuming the type of more or less shocking deformities, interfering with the due performance of functions and predisposing to the premature loss of the very teeth themselves.

"Among the cares to be bestowed during the second dentition upon the arrangement of permanent teeth, the extraction of deciduous or milk teeth is that which taxes most parents and dentists. It then appears obvious that in order that the tooth of replacement may have room to assume its proper position, nothing better could be done than to prepare that room in advance. But reason, and especially experience, modifying much this too hasty conclusion, two difficulties must at this juncture be carefully guarded against. The one consists in too early an extraction of the deciduous teeth, the other, in allowing them to remain beyond the necessary period.

"Experience and a considerate appreciation of the conditions of the dental system, can alone prevent the errors I have just pointed out, and fix the truly proper time for operating. I have ascertained that more frequent and serious irregularities are caused by too early extraction than by the opposite cause. The

deformities produced on account of having allowed deciduous teeth to remain too long a time in their situation very frequently correct themselves from the very growth and enlargement of the alveolar arch and of the whole maxillary. We should never forget that the crowns of the teeth after their eruption no longer increase in their size, while the bone which supports them remains for several years subject to the laws of the development of the entire system. Whence the results; that at the end of a certain time, some teeth which appear never to be able to find sufficient room, finally arrange themselves in the most perfect order, much to the astonishment of parents and often dentists themselves. When, in the cases, which I believe more scarce and resulting from special dispositions, the deformity is more considerable and appears to have a tendency to become permanent, we can still avert it by such operations as I shall point out subsequently. We shall find that in almost every case we can remedy the difficulty, while the exaggerated separation of the teeth, or the loss of those which have been sacrificed, ordinary results of an opposite practice usually leave no resource.

"To sum up, a long practice has demonstrated to me that the dentist as far as regards operations to be performed upon deciduous teeth, should observe the following rules as the most rational and the safest:

"1. So long as deciduous teeth remain firm, even when they begin to become loose, if no indication heralds the near apparition of the permanent teeth, nature should be abandoned to itself; there is no call for interference.

"2. When in front of or behind the milk teeth, still firm or already loosened appears a circumscribed reddish somewhat painful tumefaction, under which a projecting hard body may sometimes be felt, it is proper to extract that tooth.

"3. If one of the permanent teeth does not find, in the space left by the deciduous one, room enough to locate itself properly, and in consequence of want of room begins to deviate, we may extract the contiguous milk tooth.

"4. In certain cases, after having sacrificed accordingly with that which precede the deciduous canine to make room for the permanent lateral incisor, which we may be obliged still to extract the first bicuspid which appears at nine years, to make room for the canine which comes at eleven.

"5. We meet rather frequently with children whose canines are well set but have appeared before the first bicuspids, in such cases the lateral incisor not finding room enough in the arch, deviates anteriorly or posteriorly; its extraction then becomes indispensable. The ulterior arrangement may be left to nature, which will direct the other teeth towards the vacancy, and thus fill up the breach.

"I cannot repeat too often a counsel justified by preceding remarks,—the mouth of children should be, during the period of second dentition, examined regularly at suitable intervals by skillful dentists, who alone can appreciate the progress of dental eruption and rectify its irregularities at the proper time."

Again in June, 1855, there appears another article, "*Dental Orthopædia*," translated from *Der Zahnarzt* by F. H. Rehwenkel:

"Inferior Maxilla.—In some instances the incisors of the lower jaw protrude so far as to overlap those of the upper. * * * * In some cases, the cutting edge of the incisors of the superior maxilla come in contract with the posterior surface of the lower gums, producing irritation.

"The above named deformity may depend either upon the anomalous direction, anteriorly, of the incisors of the lower maxilla, while those of the upper are in a regular and correct position; or the teeth of the superior maxilla may incline so much inwardly as to be quite behind the circle of the lower jaw. It is a matter of great importance to distinguish between these two irregularities; and this can only be done by a very careful examination, which must take place in early youth; for in later years, when the teeth are fully grown, the constant pressure to which they have been subjected will have changed their original positions and make the first cause, or starting point exceedingly difficult to ascertain. If it is found that the deformity consists of the protrusion of the lower teeth, which not infrequently is the case, even if those instances are excepted in which pressure is produced upon the teeth by hard tumors under the tongue, and which force them beyond the upper dental arch, it is advisable, in the first place, to direct our operations principally to the deviating organs. For the attainment of this purpose, the dentist must, after the removal of the cause or complications of causes which may be the occasion of the irregularity, commence his operations upon the lower dental arch by the same means which I heretofore recommended for the correction of deformities in the teeth of the superior maxilla; namely, the direct pressure, the palates, the bars, and ligatures. When the latter are adopted, they must be attended to carefully, and their action modified and regulated to the indication of the case. When the lower teeth are in a normal position, and the upper show the inclination to fall behind the former, circumstances must guide the choice of means used to correct the deformity.

"I cannot repeat too often that a deviation should be recognized in the beginning, and the proper measures taken for its correction.

"A narrow strip of strong plate is fitted to the posterior surface of the lower circle and secured to the molar teeth. This plate is perforated with pin holes opposite those teeth which incline too much outwardly. The rim must stand a little off from these teeth, which should have strong silken cords around them, the ends being passed through the holes in the plate. Thus in tying, we can bring to bear upon these teeth any amount of pressure desirable. In my long practice, I have met with many cases, which were so complicated as to render it necessary to use both the 'direct pull' and 'inclined plane;' the former, to prepare the way, as it were, and the latter to complete the cure.

"After correcting irregularities by rational means, the exercise of the proper functions of the teeth will be sufficient to consolidate them, and complete the cure. Not so, after luxation. In this case it will be necessary to support the organ in its newly acquired position for a considerable length of time, until it is again firmly imbedded in its socket. For each of my patients, I caused to be constructed a gutter similar to that of the inclined plane, which they were required to wear at night and as it fitted accurately over all the other teeth, the regularity of the latter was by these means preserved.

"To commence with ligatures, which are usually either silken cords or light wire, I have already pointed out the disadvantage connected with their use; they are as follows: Their action is not confined to the organ for which they are used, but exerts an influence upon several.

"When I speak in favor of ligatures, I mean, of course, only those of silk, or some vegetable substance, not those of a metallic nature, as they should never be used, excepting as a support for already adjusted teeth, and even then they cannot be employed without danger to these, as well as those to which they are fastened.

"Dental orthopædia must in its practical application be governed by general rules, which may be as follows: as much as possible to preserve and improve, and only in extreme cases to mutilate; proceeding always carefully, patiently, and attentively; ever remembering the injunction of our oldest masters—*Principiis obsta.*"

H. S. Burr in the *Dental News Letter*, 1854, p. 221, describes and illustrates a flattened arch similar to Fauchard's, later adopted by many as being original. In treating "*Irregularities of the Teeth*" he says: "I commenced by fitting skeleton caps (of gold) to the first molars; a stiff bar was passed in front, one end soldered to one cap and the other end sliding in a groove. I tied the two first

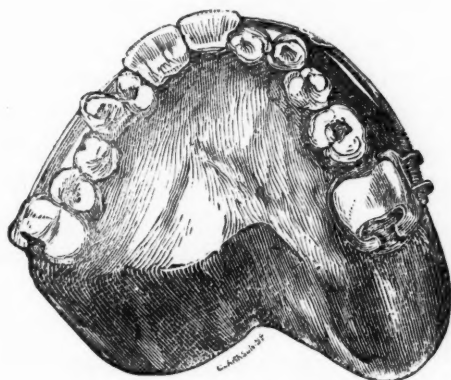


Fig. 1.—H. S. Burr, 1854.

bicuspid and the two lateral incisors to the bar with thin strips of gum elastic. The strips, being stronger than rings, are preferable."

"I kept them tied with silk for a few days, and had a plate made to fit on the inside of the mouth and teeth covering the palatine arch, and extending down one-half the length of the teeth, with half springs inside the bicuspid.

"I will take this opportunity to mention the great and absolute necessity of studying the shut of the mouth before prognosticating that an irregularity can be corrected."

This description is not very clear but Fig. 1 shows the two forms of *skeleton caps*.

H. D. Ross.—The theory that irregularity may be due to thumb-sucking, which we hear of in modern times, was mentioned by different writers during the last sixty years. H. D. Ross speaks of it in 1853. At that time he remarked—this must have been observed as soon as there was an attempt at correction—that there is greater difficulty in keeping teeth in position after they are moved than in moving them.

A. J. French, in *Gaz. De. Med.*, Paris, is of the opinion that complicated cases of malocclusion can be entirely corrected if undertaken early enough. He

believed in the extraction of teeth. In 1854 he says: "Plates of silver accurately adapted to the roof of the mouth and secured with clasps to the molar teeth and by means of gold springs or spiral springs soldered to the plates, a constant and steady pressure may be applied in any direction. In cases where it is necessary to exert a constant outward pressure, spiral springs enclosed in tubes should be soldered to the plates in such a manner that the ends of the springs shall pass upon the teeth. The advantage is that it does not require rearranging except in 3 or 4 days, with slight inconvenience can be taken in or out and is a removable appliance."

Hamell, in a paper read before *The Mississippi Valley Association of Dental Surgeons* and published in the *Dental Register of the West*, on "*Irregularities of the Teeth*," says: "The correction of irregularities of the teeth is among the first operations the dentist is called upon to perform. It develops itself as the teeth are developed, and becomes permanent as the teeth approach maturity.

"Seeing then that these are some of the results of irregularity in the arrangement of these organs, how necessary is it that we should be armed with a correct judgment and a cunning hand to enable us to restore erring nature to its proper place again. The benefits arising from regularly arranged teeth are numberless, the troubles arising from irregularity of the teeth are also numberless, and call forth our warmest sympathy.

"The tooth occupying the wrong place is not, in nine cases out of ten, the one that ought to be extracted; but one or more in the back part of the mouth, although they may occupy their proper places, must be sacrificed, that those in front, and which will more decidedly retain the contour of the face, may be brought into their proper places.

"The time of life, as laid down in the best dental works for the performance of this operation, is prior to the sixteenth year, though this operation may be performed after this time, yet with far less chances of success.

"Although the time we have mentioned is the proper one for correcting irregularity, yet a majority of those who make application for this purpose, defer it until they have arrived at their eighteenth or nineteenth year. And here a difficulty interposes, which is here to be disposed of satisfactorily to all parties. Who is to bear the blame for this delay of application? Is it the dentist for not placing the means of information on this subject in the hands of his patrons? Or is it these persons themselves for not informing themselves on the subject? We are rather inclined to give the dentist a balance, but not overmuch."

It is interesting to see the attitude taken by the dental institutions in their infancy towards the correction of irregularities of the teeth. For this reason, and more as a matter of historical record, the report of the commencement of the Philadelphia Dental College, as found in the *Dental News Letter* of 1854 has been included. Among the list of operations performed are seven cases of "*Irregularities of the Teeth*." We also find among the list of graduates several names that played an important part in the development of this important branch of dental science.

"This flourishing institution held its second annual commencement on the 28th of February, 1854, at the Musical Hall, Locust St. The hall was crowded

by a most intelligent audience. The proceedings were interesting and interspersed with music from a band engaged for the occasion. The able valedictory address was delivered by Prof. E. Townsend. After prayer, Prof. Ely Parry, in the absence of the president of the college, the Hon. E. K. Price, came forward and conferred the Degree of Doctor of Dental Surgery upon the following gentlemen:—Horton Baily, Pa.; William Calvert, Pa.; Firman Coar, Pa.; Al. G. Coffin, Mass.; E. H. Cogburn, Miss.; Ben. Cohn, Germany; S. W. Frazer, Pa.; W. Gorges, Pa.; Eri W. Haines, Del.; W. Storer How, Me.; Louis Jack, Pa.; Bernard J. Laughlin, Pa.; C. Wewlin Pierce, Pa.; I. Price, Pa.; David Roberts,

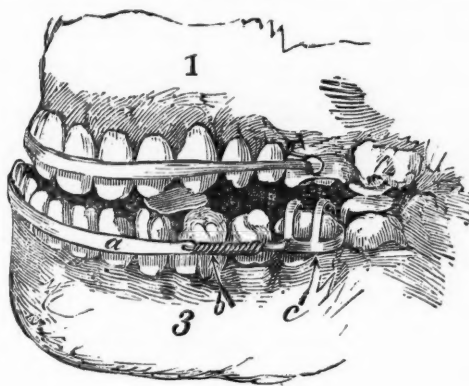


Fig. 2.—J. D. White.

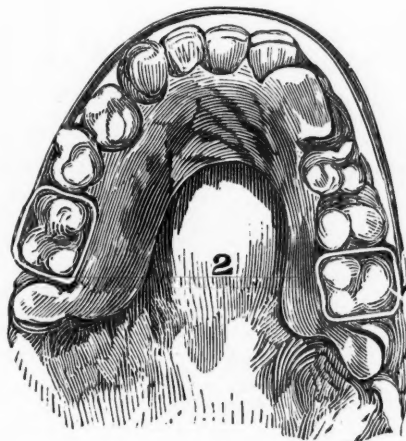


Fig. 3.—J. D. White.

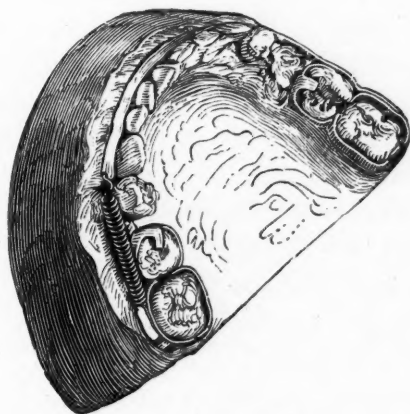


Fig. 4.—J. D. White.

Pa.; J. M. Rothrock, N. C.; John R. Rubencame, Pa.; Thos. H. Shaw, Ala.; James Trueman, Pa.

"The honorary degree was conferred upon the following named gentlemen: John Tomes, London; J. G. Koehler, Schuylkill, Haven, Pa.; P. Beck Goodard, Phila.; Chapin A. Harris, Baltimore; F. M. Dixon, Phila.; Chas. Moore, Pottstown, Pa.; J. R. McCurdy, Phila."

"The appended statement taken from the records of the college shows that all the important operations usually coming in the range of ordinary practice have been demonstrated, for which no charge is made. The operations totaled 715. * * * * Treatment of irregularities, 7.

The year 1853 marks a change in the treatment of irregularities of the teeth, due to the discovery by Nelson Goodyear, of a method of vulcanizing rubber. The new product, vulcanite, quickly led to its adoption as a means or foundations for regulating purposes. However, as the same results were obtained by means of metal bands, "bracelets," etc., prior to its adoption, further than a new means of treatment, little progress was made through its use."

J. D. White. In the *Dental News Letter* for 1855-6 and 7, we find a series of articles by Dr. J. D. White, some of which are illustrated and are referred to as Figs. 2, 3, 4, and 5. These he describes (1855) as follows: "Nine-tenths of the cases of irregularities that come under our observation are the result of a premature loss of some of the deciduous teeth.

"The prognosis depends upon their want of knowledge as to the means necessary to accomplish the object. If those dentists who cannot see how they are to be paid for their services were to give proper attention to a few cases without any hope of direct remuneration, they would be paid in information much more than in the services rendered the patient."

On page 184, 1856, he describes as follows:

"Fig. 2 is the case viewed from the left side; the first superior bicuspid, canine, lateral incisor, and both front incisors falling inside of the lower teeth, which gives a lateral and forward projection to the chin and a peculiar warp to the face.

"Fig. 3 is the apparatus for the upper jaw; it consists of a plate swedged up to fit the roof of the mouth, and extending forward against the back part of the front teeth, in the same manner as if it were intended to insert teeth upon. It has attached to it, on the left side, an inclined plane, opposite the superior canine and lateral incisor, extending outward and downward, to grasp the inferior canine and bicuspid. This answers the double purpose of helping to throw the upper teeth out and the lower ones in, and the lower jaw to the right. It also keeps the jaws apart sufficiently to allow the teeth, when they are moved, to pass each other. The bands are so constructed as to grasp over the crowns of the molar teeth in such a way as to not require filing. To the buccal sides of these bands is soldered a bar extending from side to side, and as far away from the front teeth as it is desired for them to be brought forward. To this bar, and around the necks of the teeth ligatures are well fastened, either of India rubber or flaxen thread. This apparatus must be changed every other day, and the teeth well brushed to remove all foreign substances. There are also attached to this plate caps for the back teeth to prevent them from falling toward the opposite jaw while the apparatus is worn. This fixture was worn about one week before anything was done to the lower jaw, when a simple bar and caps were placed upon it, as seen in Fig. 4 [Fig. 2]: a, is the bar in front of the teeth; b, a spiral spring at one extremity to give elasticity to the bar when placed over the front teeth; c, the bands over the second molar teeth, with caps extending over the wisdom-teeth in the same manner as the upper caps, to prevent them from rising from their sockets. This spiral spring has within it a piece of wire to prevent it from bending laterally, but it does not prevent the extensibility of the spring."

Again in the *Dental News Letter*, Jan., 1857, p. 188, in speaking of "*Irregularities of the Teeth*," Dr. White wrote:

"We referred in our last article on this subject, to the fact that the majority of cases of irregularity was the result of premature extraction of the deciduous teeth, we referred only, at that time, to the front incisors, but the same rule applies to the rest of the deciduous set. The cuts then given did not well illustrate our cases, but it was discovered too late to have them corrected. It is a very beautiful operation to correct a difficult case of irregularity of the teeth but it is in our humble opinion a much greater triumph of skill to prevent its occurrence. Every writer censures the parents for not attending to their children's teeth, so that such cases shall not occur, but the truth is the other way, if neither the parent or dentist meddles excepting in plugging the first set, irregularity rarely occurs."

In the January issue, 1859, of the above mentioned journal, Dr. White illustrates his method of correcting the "*Projection of the Lower Jaw*" by the use of the chin cap. As his method was similar to the one already described by Fox, and similar to Westcott's (1844), it will not be necessary to go into the detail of same.

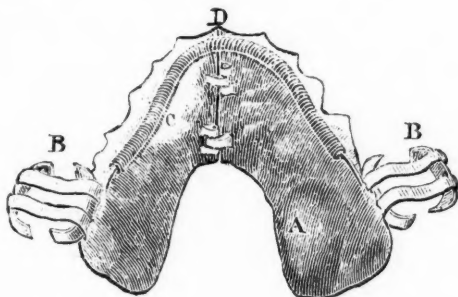


Fig. 5.—Hinged plate as used by J. D. White



Fig. 6.—Bar used by James Taylor

Again in the *Dental Cosmos*, Jan., 1860, p. 281, we find another appliance as devised by Dr. White for *Expanding the Jaw* which he describes as follows:

"The following is a very simple but effectual method of expanding the superior maxillary: * * * * By placing a plate in the roof of the mouth as far up as it can be extended, but cut through, to make two halves, with a hinge in front, back of the incisors; this plate or plates opens and shuts like a hinge. These plates are fastened to the first molars or bicuspid, as the case may be, and a spiral spring is attached on either side, with the bow of the spring extending around behind the front teeth and close to them so as to be out of the way as much as possible. * * * * We regard it as necessary that the whole jaw, teeth and all, should be moved together, to insure success. The accompanying figure shows the apparatus: A is the plate; B, the crib bands for the first molar teeth; C, the spiral spring; and D, the hinge joint (Fig. 5)."

James Taylor describes a new and interesting way to correct irregularities, in the *Dental Register of the West*, 1855:

"We constructed a bar represented in Fig. 6. This bar is just long enough to allow its end to rest on the cuspid teeth, and is so bent at the ends as to partially embrace their labial face.

"Two small hooks are soldered to this bar, one of which hooks over the cutting edge of the left central incisor, and the other over the edge of the right lateral incisor. They are made of small strips of ordinary gold plate. This bar is made of two strips of gold plate soldered together, first having been adjusted with pliers, to fit the front teeth, standing off of the irregular tooth, so as to permit traction to draw it to its proper place. The hooks kept the bar far enough below the gum so that the ligature which passed around the irregular teeth and was tied to the bar, kept the thread from irritating the gum,—a few days sufficed to bring the tooth to its place—the ligature should be removed at least every other day and be reapplied, this gives opportunity for cleansing the teeth and tightening the ligatures.

"The first step in the operation to restore symmetry in this case, was to take an accurate impression of the upper teeth; this was done in the usual manner with wax, and from this a plaster model was procured. We then took a piece of gold plate of ordinary thickness, for under sets of teeth, and about one or two lines wide; this was bent into the circle—into which we wished to bring the teeth—either end of this bar resting on the anterior molar teeth, and its center merely



Fig. 7.—James Taylor.

touching the incisors. A second piece was then made like the first, and these soldered together and then filed up to the size we wished.

"Clasps were then fitted to the labial face of the molars, passing as far between these and the posterior bicuspid as was practicable. The bar was then soldered to these, as is represented in Fig. 7. When applied, it is attached to the molars by the clasps, and circles from these around in the proper circle of the teeth, resting on the central incisors; the bicuspid or cuspid stood within this circle about the thickness of these teeth.

"This we accomplished as follows: First wedge the teeth apart sufficiently wide to allow a good sized gold wire to pass between them. We then adjust a gold bar, extending from the lateral approximal edge of each tooth; this is fitted to the lingual face of these teeth, and stands off from them at the medial line; a hole is made in the bar parallel with this line, and a gold wire inserted and soldered fast. This wire passes between the teeth and is sufficiently long to pass through a gold bar which is adjusted to their labial face, on the end of this wire is cut a screw, and for this a tap of thick gold plate is made. When this fixture is applied, the tap or nut is screwed on until it is drawn tight on the teeth; and every day or every other day screwed up a little tighter. Each day brings the two gold bars nearer together, and hence turns these teeth in their sockets."

Fred J. Clouston, 1856, in the *British Journal of Dental Science*, p. 47, on "Irregularities of the Teeth," says:

"The lower teeth bit outside the right lateral and left canine, and both the deciduous teeth were still quite firm, which I, of course, immediately extracted, together with the first bicuspid on the right side, which prevented the cuspidatus from assuming its position in the arch. I then adopted a large plate to the palate, capping the molar and bicuspid teeth, to which I firmly attached the piece by clasps; and here I would remark that a great deal of time and trouble may be saved by securely fastening the plate to the masticating teeth, so as to obtain what mechanics call 'a good purchase.' This should be attended to in all cases, whether the teeth are to be drawn in or pushed outwards. I then fastened India rubber cushions to the plate, so as to press against the three teeth to be moved, and drew the lateral away from the central incisor, it being pressed against that tooth and forming an obstruction to its coming outwards. I accomplished this by means of a ligature passed around the tooth and fastened to the plate."

Another article in the above named journal (p. 171) by an anonymous writer describes his method as follows:

"I extracted the first bicuspid on either side, and made a strong gold plate for the lower jaw, capping all the teeth, with a projecting lever on each side for the lateral to bite on. At the same time, I applied elastic bands from the molars to the canines on each side. This action was kept up, occasionally altering the pressure, for about two months, until the laterals were sufficiently forward to escape the under bite. I then made a plate for the upper, still keeping the pressure on the laterals, and conveyed an elastic from the center of the palate to a crossbar outside the centrals.

"I have invariably accomplished much more by adopting plates to the under than the upper jaw. The patient has less annoyance, and the operator obtains a greater pressure by the action of the lower jaw than can be gained by India rubber cushions."

Samuel Maclean read before the *Odontological Society* of London, Feb. 28th, 1857, and published in their transactions, a paper on "*The Removal of the Four Permanent First Molars, in Certain Cases, at an Early Period of Life.*"

"The practice, as I have said, which it is my object to advocate in the present communication, is the systematic removal of the four permanent first molars whenever the arch has a decided tendency to be overcrowded, and especially when the teeth in question are affected by caries.

"I now proceed to consider more particularly the advantages connected with the practice I am advocating, and also the objections which may be urged against it. The advantages I conceive to be as follows:

"1. The prevention and correction of the simpler forms of irregularities in the easiest and most desirable way, in a great majority of cases, without the aid of mechanical means; in all, in such a manner as least not to disfigure the appearance of the mouth.

"2. The promotion of a healthier state among the remaining teeth, and an increase in the facility of treating caries when it presents itself.

"3. The prevention of the distressing, and in some cases even very serious

symptoms, which frequently accompany the development of the wisdom-teeth in over-crowded arches, and a material diminution in the chance of the formation of sinuses in after life.

"The question really at issue is: 'How are over-crowded arches most effectually and most safely relieved?' The cases I have brought forward in support of my view are sufficient, I think, to justify the course I am advocating.

"I now proceed to consider the objections which may be urged against this practice, and the disadvantages connected with it.

"1. Its apparent severity, and, in the eyes of sensitive persons, even cruelty.

"2. Its apparent needlessness at the time of operation.

"3. The slowness and self-operating character of its results.

"4. Its occasional difficulty."

W. H. Allport, Dental Register of the West, 1858, p. 21, reported the following case of irregularity and method of treatment.

It is a case that occurred recently in his own practice, and was an extreme case, one that by the ordinary mode of treatment would have been very difficult,



Fig. 8.—Method devised by W. H. Allport.

if not impossible, to correct. The appliance is something new, and proved very efficient in a comparatively short time. The teeth now occupy a good position. The operation produced an entire change upon the face of the patient. The following description of Dr. Allsport's is very clear and concise and by the aid of the cuts, will be at once comprehended:

"Fig. 8A represents the teeth at the expiration of five weeks after the apparatus was applied.

"Fig. 8B represents the plate, clasped to two molars, on each side, with the band extending around the outside, and to which are soldered two hooks (a) passing over the ends of the incisors to prevent the band slipping too high upon the teeth. To each end of the band is attached a screw (b) passing through a nut (c) soldered to the clasp, and by means of which the band was tightened every other day, on each side of the mouth with a screw driver (d).

"This process was continued for five weeks; the whole was then allowed to remain without further tightening for two weeks longer when the apparatus was removed.

"To retain the teeth in this position, a plate was again attached to two molars with narrow strips of gold soldered to it, passed over the inside, and hooked to the ends of the incisor teeth.

"During the whole process, the patient made but very little complaint of soreness or of inconvenience from the apparatus. The patient was a lady of twenty-two years of age."

H. E. Peebles, 1858, pp. 64, 117, *American Dental Review* first describes the condition of the patient:

"In this case three defects existed and demanded attention; viz., there was not space enough between the left and right first bicuspid, the mouth was too narrow; secondly, it was too long; i. e., the incisors projected too much; and last, but not least, the arch was broken and irregular.

"We first widened the mouth, between the bicuspid, full three lines; we shortened it two lines, and repaired the broken arch by gently pressing the deviat-

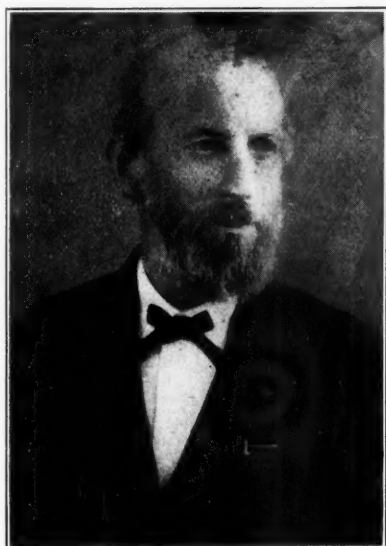


Fig. 9.—Dr. H. E. Peebles.

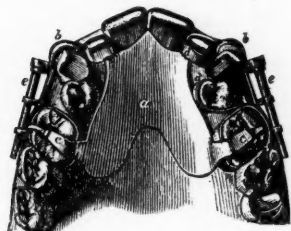


Fig. 10.—The use of the screw as explained by H. E. Peebles.

ing members into their line, and thus restoring to the face its wonted order, symmetry, and beauty.

"She was discharged with a gutta percha support in the mouth to retain the teeth in situ, and directed to wear it one month."

On page 117 Dr. Peebles says:

"On the cause or causes of irregularity of the human teeth, there need be very little said at this time and in this place, as I presume we all agree that want of room, owing to a poorly developed maxillary bone, induced mainly by our artificial mode of life, extending down through many generations and co-extensive with our civilization.

"But upon the treatment it may not be inappropriate for me to say a few words. I deem all cases of irregularity, so far at least as they have fallen under my observation, remediable or curable. I prefer taking charge of such cases, as a general rule, at a period of age above, rather than below twenty-five years of

age. I then have a mature mental and moral as well as a mature physical subject to deal with.

"I have lately tried the screw as a motive power, with which I am so well pleased, that nothing short of a patent taken out for its application would induce me to abandon its use. (See Fig. 10.)

"I find little trouble and complaint in consequence of soreness under the pressure of the screw, but a great deal from elastic ligatures. I think that the people are not generally well informed in regard to the importance and practicability of this operation, and here let me suggest the propriety of adopting some means whereby the community generally may be educated on this subject."

Spalding, in the same journal, said he regarded premature extraction of the deciduous teeth a fruitful cause of irregularity. He also thought there existed causes, having their origin in the constitution, and resulting, in part, from the fusion of races, which has long been going on, on this continent. "Different races of men, or different families of the same race, are often marked by some particular configuration of the teeth and jaws. Sometimes we find the teeth large and broad, accompanied by a corresponding breadth of arch in maxillary. Sometimes we also find the teeth small and narrow with an arch corresponding thereto. Now suppose we bring together persons of these different types, and their offspring should inherit the configuration of the maxillary from one parent and the form and size of the teeth, from the other; the result would be obvious; the teeth would be either scattering or crowded; and in the latter case the interference of art is often required."

In the treatment of irregularities, he was often compelled to extract. In correcting slight irregularities in the teeth of children he depended mainly upon such pressure as could be exerted by some instrument in the hand, applying as much force as the teeth would well bear once or twice daily, until the tooth became sufficiently loosened to admit of being brought at once into its proper position. He then, when necessary, bandaged the face so as to maintain the occlusion of the jaws until the tooth would retain its place. "A single night is sufficient to accomplish this, although a longer time is sometimes necessary."

H. J. B. McKellops in the *American Dental Review* of the same year did not agree with Dr. Spalding in the view put forth as to the effect of mixed races. Thinks no rule can be adopted which shall be found applicable to all cases, but that the proper course of treatment would readily suggest itself when the case to be operated upon is presented.

He describes a case of protrusion of the lower jaw, caused by a false articulation, which he had treated successfully. To regulate the point of occlusion, he extended the lower molars by the use of blocks of gold attached to the teeth by clasps; these blocks were reduced by the file as the treatment progressed. The protruding chin was gradually brought into its true position by the use of Fox's bandage, which was tightened daily. The time occupied in bringing into position was about four months; treatment, however, will probably be necessarily continued some four months longer, in consequence of the shortness of the molars, the growth of the upper ones especially, having been checked during their eruption by the manner in which the teeth at that time articulated.

W. Dalrymple, in 1858, *American Journal of Dental Science*, p. 56, on "Deformity Occasioned by Contraction of the Arch of the Superior Maxillary, and Irregularity of the Teeth Successfully Treated," says:

"My first object, so to speak, was to unlock the jaws, and to break up the constant tendency by shutting the mouth, to increase the difficulty. This was done by first preparing a firm plate for the basis of my future movements, upon which was soldered studs to keep the jaws apart, to break up the articulation and at the same time so arranged as to act as inclined planes in moving the two sides of the upper jaw outwards or from each other whenever the jaws were closed.

"I also used a bar of wood reaching from one canine tooth to the other, and of such length as to press firmly upon them. This was supported in its place by a plate that was swaged to fit accurately to the palatine portions of the upper jaw, and about the necks of the teeth. To this was soldered two loops through which was passed the bar or brace. These were renewed and lengthened from day to day."

Again in the *New York Dental Journal*, p. 121, we find the following:

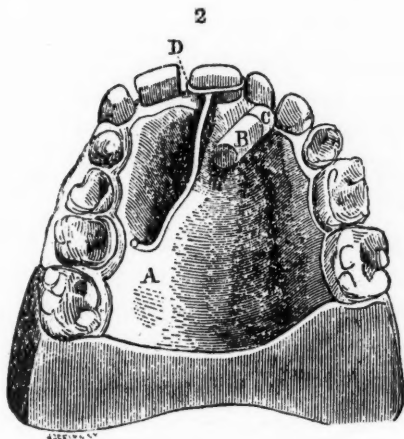


Fig. 11.—W. Dalrymple, 1858.

"I took an impression of the mouth, and struck up a plate fitting accurately to the posterior surface of all the teeth and clasped to the temporary molars. By this time, the lateral incisor crowding inwards and contracting the arch, we soldered to the plate immediately opposite this offender a little socket (see Fig. 11) with the palatine end closed. In this socket was placed a plug of hickory wood, (b) which was lengthened from time to time, fitted so as to press firmly upon the tooth, which operation had the effect in a few weeks of giving me room to operate upon the transverse central. I now fitted a band encircling it quite near the gum; to this was attached an arm (d) of spring wire, and soldered to the posterior portion of the plate covering the mouth, having considerable length, that it might force the tooth around. The arm was changed from time to time, until I had the satisfaction of turning a tooth completely on its own axis."

N. W. Kingsley. The first article to be contributed by perhaps the foremost of the early modern pioneers in our branch of dental science, we find in the *New York Dental Journal* of 1858. Kingsley, closing this article saying, "Begging

your indulgence for occupying so much of your space in this, our first communication to any Dental Journal" could hardly dream of the vast amount of space the literature he wrote during his brilliant career would consume. "*On Irregularities of the Teeth—Treatment*," p. 81, he wrote:

"A hickory stick, well known to the profession as pivot wood, of proper length was first placed across the mouth and forced between the second bicuspid, that being the point at which the greatest expansion of the jaw was required. This was renewed daily, forcing in a longer one each time.

"Another was added after a few days between the right first bicuspid and left lateral incisor; also changed from day to day. Three or four weeks sufficed to force them out all that was desirable. A gold band was then bent to a comparatively true curve, reaching from molar, resting on the labial surfaces, around to molar and tied with floss silk to those teeth which had been forced into position by the braces; the branches still remaining to keep them in their place. Elastic rings were cut from small rubber tubing, and slipped over the remaining teeth and drawn outward and tied to the gold band. After a few days the braces were removed, the band acting upon the teeth in a manner to hold them without the aid of the braces; the band was removed, new ligatures applied, and the teeth cleansed thoroughly twice or three times a week. From four to five weeks brought the teeth all into a good position. A plate was then fitted to a model, obtained in the usual manner, extending back to the molars and across the palatine arch, and tied to the bicuspid. This was worn from three to four months, until the parts became settled and firm.

"In remarking upon this subject, I cannot avoid contrasting the plan of using braces and ligatures with the inclined plane, which, until quite recently, was the almost universal recourse with the few who attempted the correction of irregularities. From the supervision of a large number of cases, and the observation of its actions and results in others, I am led to believe the inclined plane defeats its own purpose. Its action is well known; its intention is to strike the offending teeth at every occlusion of the jaw, and thus force them into position. But as the class of patients requiring treatment is confined to youth, the teeth in a few hours become tender to the touch, when they will sooner go without masticating their food than strike the teeth with sufficient force to produce any movement, and unless all the masticating teeth of one jaw are covered and very accurately articulated to the others, a worse result is more than likely to happen; viz., elongation of the molars and bicuspid and entire change of articulation.

"Neither do I regard it as necessary that blocks should be built on the molars to masticate upon, in a case, for instance, where the superior incisors close within the inferior; but a very few days are required in the passing over, when the molars would be required to be kept apart, and there will always be more or less tenderness of those teeth firmly braced, which will prevent the patient from biting with sufficient force upon them to drive them back. A patient would not acquire sufficient command of masticators in so short a time to make them of any material service. Neither would I approve except in rare instances, of the extraction of permanent teeth that stand out of the arch, because the arch is nearly full without them. In a majority of cases the jaw can be expanded, and they restored to

their normal position. I believe nature to be the best model we can follow, and no one can doubt but it is her intention, and, as a general rule, most conducive to the beauty of the individual, that all the permanent teeth should stand in the arch.

"In these days of the rapid increase in the number of those who require the skill of the dentist in developing the beauty of the permanent teeth, it becomes us as a profession to bring to our aid all the resources of science and art.

"It is surprising the vast amount of culpable ignorance daily and practically displayed by the profession, even in regard to the development of the permanent teeth.

"Removing temporary teeth to make room has been the cause of more irregularities than Dame Nature was ever guilty of."

Again on page 117, we find "*On the Treatment of Particular Classes of Irregularities*," by N. W. Kingsley.

"I despise, as much as any one, hobbies; but no man ever made any progress, beyond what was laid down in the books as orthodox, who did not, in the opinion of some, ride a hobby. Consider then, for the moment, regulating teeth as my hobby.

"The increased interest which this excites in the profession induces me to comply with your request to send you the following article on '*The Treatment of Particular Classes of Irregularities*.' Commencing with the central incisor of the upper jaw, the most common form of disarrangement is when one central falls within the lower jaw, and is held thus out of its arch at every occlusion of the jaws. If the patient is young, say under twelve, the treatment is simple, and the progress rapid. A gold band of half round wire, bent to the curve of the jaw, placed on its labial surface, its end supported by tying with floss silk ligatures to some of the back teeth, and a ring cut from small India rubber tubing, is all the fixture necessary. If the temporary molars are in, and tolerably firm, the ends of the gold band may be tied to them; no harm can follow, as there is no strain upon them. Before fastening, slip the rubber ring on the band, and when the band is secure in its place, bring the ring opposite the offending tooth, and stretch it over it. No blocks are necessary to keep the jaws apart. No matter how much the lower teeth lap over it—unless the jaws are bound together—the action of the gum elastic will bring into line within a few days, and, ordinarily, with very little soreness. The rubber rings ought to be changed often, as they lose their elasticity. When once lapping outside the lower jaw, there is no danger of their getting in again.

"Another form of irregularity of the centrals is, when they stand obliquely to the arch, their labial surface describing two sides of a triangle; or, as may happen, one or more standing directly across the jaw at a right angle with it. The treatment, as usually given, is a complicated one. Sometimes a fruitless effort is made to fit a gold collar so firmly to the tooth that a short lever soldered at a right angle to it will, by the aid of elastic fastened to the end of the lever, pull it around; a very pretty way of accomplishing the object in theory; but unfortunately; the practice in a majority of instances (owing to the difficulty of making the collar hold) does not sustain the theory; besides, even if it could readily be made to hold, the fixture is a cumbersome thing. Another splendid piece of steam-

engine machinery to attain the same object, I saw in the mouth of a little miss, between nine or ten years of age, a few days since. A central incisor was slightly twisted from its true position, a gold plate was fitted across the entire palatine arch, passing over and covering the crowns of the molars, a gold bar was soldered to the plate on the labial surface of the molars, passing around in front, resting on the outer corner of the offending central and farther on soldered to the palate plate on the opposite side of the jaw from where it started; so much to keep one corner of the tooth where it belonged. Another plate was fitted over the lower jaw, with an inclined plane to strike the opposite corner of the tooth, and twist it into place—beautifully—only, after wearing it between two or three months, it didn't. The author of this wonderful piece of mechanism has, within a couple of years, obtained a patent for his great improvements in dentistry, in making—never mind; spare him.

"The accompanying engraving will illustrate a much more simple and effectual method. It represents the jaw of a miss, 13 years of age; the irregularity of the incisors successfully corrected by the following treatment. Fasten a gold bar as before described, file notches in it as follows, one on each side

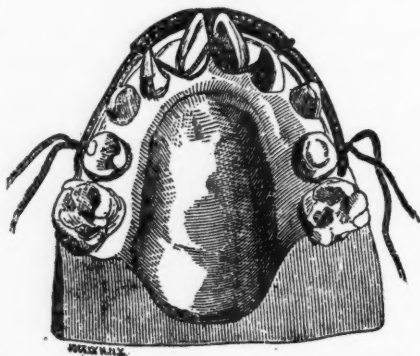


Fig. 12.—The first method of N. W. Kingsley to correct irregularities of the teeth, 1858.

against the space next the laterals; before tying the band in situ, take two elastic rings, tie them to the central notches, stretch one of them one way to the notch and tie it, the other in a contrary direction, and fasten it. (See Fig. 12.)

"Secure the bar in its place and carry the elastic bands over the teeth. The engraving will show the triangular form the rubber band is compelled to take. Common sense will explain its action—a month with a young patient will accomplish the result. I care not how much trusted a central is in the jaw, so surely as India rubber is elastic so certain is success. Essentially the same treatment is required when one central, in addition to standing obliquely, laps over the other central; to bring it down into line, or any other tooth that stands too prominent, instead of floss silk ligatures at the end of the gold bar, use elastic rings tied to notches—for instance, file the notch from one-sixth to one-eighth of an inch, formed of the first molar, on each side, fasten the rings to the bar and stretch them back and over the molar. The effect will be a constant backward strain on the gold band, which, resting on the too prominent teeth, will force them down into line. The following treatment is peculiarly applicable to the lateral incisors of either jaw, and consists of ligatures and gum elastic only. The usual manifes-

tation is the dropping of the laterals within the lower ones. Wax a strong silk ligature around the first molar and the bicuspid back and forth, so that the three may be bound together, and may form an anchorage; treat both sides in the same manner. On one side fasten an elastic ring by the ends of the silk, close up the bicuspid.

"Another manifestation not uncommon is the eye-tooth closing within the lower jaw.

"It can be restored with a band and elastic, or a wooden brace across the mouth. The only difficulty is owing to its peculiarly inclined conformation upon its lingual surface. A ligature or brace will be very apt to slip off. In such a case the following is certain: with a very small diamond pointed drill, make

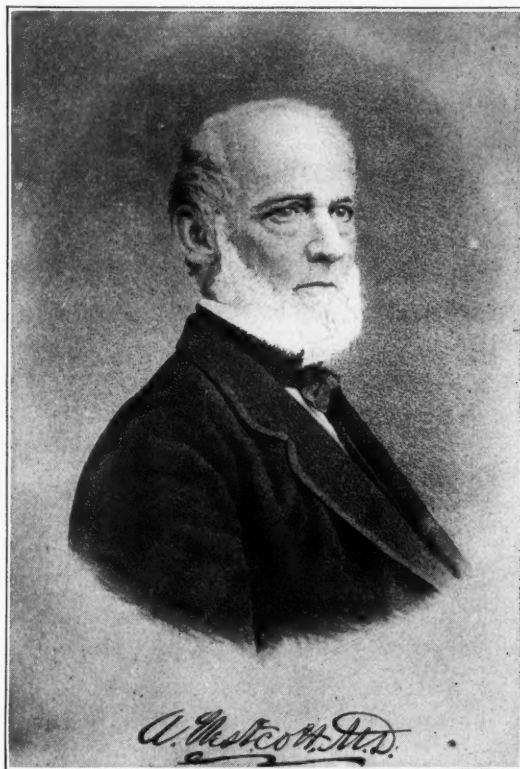


Fig. 13.—Dr. A. Westcott.

a hole high up on the swell of the tooth on the inside about one line deep. Fit a piece of condensed hickory for a plug—with the end standing out sufficiently long to catch and hold the brace or ligature.

"In the end plug with gold. Of two evils choose the least—it is better to drill the hole and restore the tooth than submit to the deformity."

A. Westcott, 1859, *Dental Cosmos*, p. 60, undertook the correction of the entire maxilla. In his account we find several novel and interesting appliances of metal for both lateral and anterior expansion. "*A Case of Irregularity.*"—"It is a case presenting a combination of difficulties—not merely one of great irregularity of teeth among themselves, but this was accompanied by a jaw so contracted

as to allow the entire circle of the upper teeth to shut inside the teeth of the under jaw.

"I take occasion here to say that, in my judgment, plates, as the base work of any fixture whatever, in cases where the object is to expand the jaw itself, are wholly inadmissible. I do not say that it would be impossible to effect the object in this way, but while they are very insufficient, they require as much tending as an infant, and, at that, will need renewing at least once a week. No one man, by devoting his whole time to this kind of apparatus, could possibly have under treatment more than five patients at a time; and, at that, his own nerves and his patient's gums would be alike in a state of constant irritation. They are neither capable of self-adjustment, nor of being adjusted, unless reswaged.

"I conceived a plan by which I might dispense entirely with plates, and supply their place with a simple, governable, and almost self-regulating fixture—one which could be managed by the patient safely and efficiently, for from one to three weeks at a time, without any attention on the part of the operator, and then requiring not more than ten to thirty minutes.

"My first object had been, and still was, to expand or spread the jaw laterally—the upper jaw being, at a point opposite the bicuspid, nearly half an inch too narrow to articulate properly with the corresponding teeth of the lower jaw.



Fig. 14.—A. Westcott's method "to expand or spread the jaw laterally."

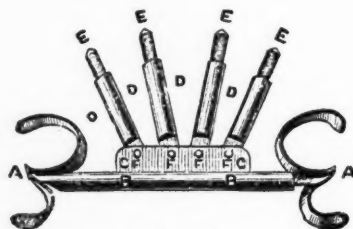


Fig. 15.

"This consists of double clasps, (for each bicuspid) and both soldered to a cross-bar, bent so as nearly as possible to fit the arch of the jaw. This was fitted in all respects as clasps are fitted to a plate, only substituting the bar (made of silver wire, No. 17) for the plate. This was made to fit snugly and firmly, and placed upon the teeth, with directions that the patient return the next day.

"This fixture worked very well and made fine progress, and the only drawback seemed to be that it was too constrained in its action, and was inclined to irritate the gums. It then occurred to me that this difficulty might be overcome by attaching the clasps to the bar differently, by letting the attachment be a hinge joint, that should indeed have some freedom of motion in every direction, and accordingly I substituted for the first, the fixture seen in Fig. 14. This consists of the double clasps, as described above, to which was soldered semicircular flat pieces, for the double purpose of receiving a pivot, and as a protection to the gum about the teeth. The end of the bar is then flattened, or an eye soldered on to it, (which is better) and attached to the flat pieces on the clasps by a firm rivet. If it is desirable to move both bicuspid equally, and it is found they move with equal pressure, this rivet should, of course, be placed so as to bear directly midway between them. It will readily be seen that this is a fixture which will

perfectly adjust itself to both teeth at the same time. The pressure against the teeth with this appliance is regulated, as in the first case, by periodically straightening the bar.

"My next statement was the fixture represented in Fig. 15. This consists, as in the former pieces, of double clasps (a a) taking the places of those on the bent bar. These clasps are connected by a straight bar, which is made nearly the whole length of tubular wire. This tube has a screw cut in its inside the whole length, and is soldered to one pair of the double clasps. The other pair of clasps are soldered to a wire which screws into this tube, the object being to lengthen or shorten the bar at will. The clasps being nearly fitted to the teeth, and the bar so adjusted as to admit of their setting easy, we have the starting point. I will incidentally say here, that I am by no means certain, but that this fixture thus far described, (attaching the clasps as in Fig. 14) might with advantage, be submitted for the bent bar heretofore described, for getting lateral expansion in all cases.

"To complete this fixture for the purpose of moving forward the front teeth, I next soldered a flat piece (c c) of sufficient width for hinge joints to connect with it the tubes (d d d d) which are to receive the spurs, (e e e e). These tubes, which have a screw cut on the inside, are attached to the flat piece on the bar by first soldering to the end of each an eye, (f f f f) consisting of a flat round piece to receive the rivet holding it to the main bar. Into these tubes are screwed the spurs, which are to bear and press against the teeth to be moved. These spurs are kept in place against the teeth by making a slight depression in the teeth themselves, with such a drill as is used for drilling steel or other metals.

"When the apparatus is thus prepared, the clasps are adjusted firmly, and these spurs are brought forward, and the points inserted into the depression in the teeth—each one being so adjusted by its screw in the tube as to exert a gentle pressure against the tooth. As to how many of these spurs shall at first be put on, must depend upon the number of teeth to be moved, and, of course, upon the judgment of the operator.

"The primary objects to be kept in view in deciding upon fixtures for regulating the teeth are to choose such means as shall exert firm and steady pressure, that require the least possible alteration, that their periodical adjustment shall be simple and easy, and, if possible, such as can be managed by the patient. Anything short of such an arrangement requires an amount of time, and involves a perplexity on the part of the operator, which must constrain him either to discard such cases or to charge such a price that would, in most instances, be beyond the means of the patient.

"Before closing this article, I wish to make a few general suggestions to the young practitioner, which may be of service to him in his management of this very interesting, though often perplexing, class of dental operations.

"1. Never undertake to regulate teeth until the first set of teeth are shed, and the second set are in their place. I do not mean by this, that we should never attempt to prevent irregularity by timely extraction, and perhaps by other means.

"2. When a case is presented, and the proper time has arrived for commencing operations, let the inquiries be—'Does the patient, or the parent, or the guar-

dian, fully appreciate the nature and importance of the operation, so much so, as to place the patient fully at your control, and cheerfully to remunerate you for your time and skill?' If both these interrogatories are answered affirmatively, then you may safely undertake the task; but if either are even doubtful, and especially the former, you had better dismiss the case.

"3. If you decide to commence the operation, take accurate impressions of both jaws, and of the two in combination, or an articulating impression; and, before you see your patient again, or prepare any fixtures, study them carefully and thoroughly, and come to definite and distinct conclusions before you make the first move that is seen by the patient.

"4. Set the price, if you can, before you commence, and require at least one-half in advance (which often secures a punctuality which nothing else will) and be sure to set it high enough, (and there is little danger of your getting it too high) and then be faithful to the last degree, whether you make or lose money. Never curtail any effort for fear your arrangement may not prove profitable.

"5. Consider well the constitution and the health of the patient. If the constitution is naturally feeble, and especially if the health is bad, better by far run the risk of confirmed irregularity than undertake any of this kind of much magnitude.

"6. Never be discouraged, my young friend, at a failure.

"I have drawn out this article to a degree of prolixity otherwise wholly unpardonable, expressly to show you that twenty years' experience cannot exonerate us from disappointments and failures; and also to show you that these may be overcome by close study and patience. Because you have been successful in one case of regulating, it does not follow that you are prepared to start off at railroad speed on the next. Every case is a new one, and however well you may be posted in general principles, you must study this particular one as closely as if you were in fact a beginner. No field in dentistry presents greater scope for the exercise of close study, the correct applications of principles and sound judgment, and none, if successfully cultivated, yields a richer reward in the satisfaction it brings to the operator."

In 1844, *American Journal of Dental Science*, p. 147, he illustrates and describes the "*Operation for Correcting Protrusion of the Under Jaw*."

"We have seen a single instance which, from the great length of the under jaw, we not only presume was congenital, but that a remedy could never be affected by art. In this instance the lower jaw could not have been dragged from its natural position by the upper teeth, as the incisors of the lower jaw were at least half an inch anterior to the corresponding ones of the upper jaw.

"In the treatment of this case we followed, with a few exceptions, the directions of Dr. Gunnell, of Washington City.

"In this case, we first prepared a plate with clasps, in all respects, as we would do with the view of inserting plate teeth.

"The clasps were attached to the first permanent molars, (the second not having made their appearance) and so that the whole could be easily removed and replaced by the patient. To this plate, just within the circle of the clasp and inside the teeth, were soldered standards, resembling the linings of plate teeth

and passing sufficiently below them to admit of the blocks being attached, which was done by a gold rivet. These blocks were of such thickness as to separate the points of the incisors about one-eighth of an inch. We greatly prefer this method of securing the ivory blocks in their proper position, to that described by Dr. Gunnell, for several reasons. In this way we obviate the difficulty which frequently, and indeed very generally exists, of securing the blocks; thus avoiding all risk of their getting misplaced, or of any accident which might occur by their getting off, especially during sleep.

"The only teeth to which we can apply ligatures, are frequently so short, and of such shape, that it is impossible to secure blocks by ligatures alone, without carrying them so far under the gum as to do great mischief. We think that ligatures of any kind, and for any purpose as connected with teeth, should always be avoided when practicable. Another important object is also gained by this arrangement; that of enabling the patient to remove them at will, for the purpose of cleansing the mouth and teeth; and the operator to make any necessary alteration.

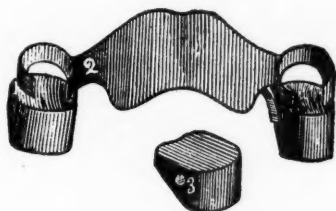


Fig. 16.—Apparatus of Westcott to "correct protrusion of the under jaw," 1844.



Fig. 17.—Chin Cap as devised by Westcott in 1844.

"This apparatus is represented in Fig. 16. The fixture being thus prepared, and adjusted to its place, the bandages are next applied. These are represented in Fig. 17 as also the contour of the face after the operation was completed.

"As the whole pressure from both bandages comes upon the chin, great care should be taken in adopting a pad for it, which shall be both easy and firm, before the bandages are applied. Pads should also be applied to all points where the bandages produce any irritation.

"After this object is, to some extent, attained, the tension of the oblique strap may be gradually increased. It will be perceived, moreover, that the blocks should be placed as far back as possible, for we thus augment the lever power by increasing the length of the long arm, or the space between the fulcrum, or block, and the point at which the power is applied, viz., the end of the chin, and at the same time equally diminish the short arm, or the space between the block and joint of the jaw. The bandages should be removed each day, and the mouth thoroughly cleansed and the face, particularly about the joint of the jaw, rubbed with some

mild liniment. The camphorated liniment, made by dissolving camphor in sweet oil, is perhaps as good as any that can be recommended.

"We now altered the blocks in two very important particulars. They were at first of equal thickness from end to end. This shape was changed by filing them nearly to an edge, from front backwards, making them wedge form, with the base looking forward. (See Fig. 16.) This constituted an inclined plane, so that the tendency of the pressure, made directly upwards, was to throw the under jaw back.

"If this irregularity should be considerable, so as to interfere with the main operation, we advise that two separate operations be made of it; first, for the correction of the irregularity of the teeth, and afterwards for the protrusion of the jaw. But if only one or two of the upper teeth point farther in than the rest, the whole may be attempted at the same time. This may be easily accomplished without retarding the main operation, by soldering straps on to the plate at nearly right angles with it, passing round behind the teeth we wish to bring forward, like the lining or back of a plate tooth. This piece must come so far below the point of the tooth as to be caught by the under teeth. The lower extremity would at



Fig. 18.—J. H. McQuillen.



Fig. 19.—J. H. McQuillen.

first require bending forward, so as to shut outside the lower incisors, and so that they will exert due pressure upon it when the mouth is as nearly closed as it may be while the blocks are in their place. By straightening this standard slightly each day, as the tooth yields, we, as a general rule, correct any irregularity of the teeth as soon as the general object is accomplished or the jaw is brought into its proper position.

"If the lower point of this gold strap or standard should make undue pressure upon the under tooth or teeth on which it rests, the lower extremity may be widened to any extent, even so as to include every under tooth."

J. H. McQuillen. In the *Dental Cosmos* for November, 1859, Dr. McQuillen describes a case which came under his treatment.

Dr. McQuillen alludes to the fact that irregularity may be either congenital or acquired. The first was frequently due to hereditary transmissions; and the latter in the majority of cases, to premature extraction of the deciduous teeth,

though recognizing at the same time, other influences as prolific causes. Of the congenital origin, abnormally small maxillæ are frequent accompaniments and causes. "The most difficult and complicated case that could be presented to the practitioner for treatment is one in which the superior maxilla is unusually small; the alveolar arch contracted; the inferior maxilla preternaturally large, with the lower teeth outside of the upper, and the osseous tissue more dense and unyielding than ordinary."

Of his own practice, in former years, he had been in the habit of employing silk ligatures, thrown around the necks of the teeth and tied to the old-fashioned bar passing in front of them. The bar similar to Fig. 18*b* can be made of gold or silver, and is perforated at certain points with holes which, when it is adjusted, should be opposite the teeth to be acted upon. The silk ligatures are passed



Fig. 20.—Dr. C. A. Kingsbury.

through these holes preparatory to being tied. This plan is a very slow and unsatisfactory one, and after trying it for some time he had abandoned it altogether, substituting in its place, within the last three years, a modification of the same, made by passing a thin, flat file through the bar from above downward to the holes cut in it, thus forming an apparatus such as Fig. 18*a*. In lieu of silk ligatures he also employs India-rubber rings, cut from very small French tubing. When applying this arrangement, as the rings are so small that it would be a difficult and clumsy mode of procedure to stretch them with the fingers, he uses right and left curved approximal burnishers for that purpose; passing each of these inside of the ring and drawing them apart, the rubber is extended, and with facility slipped over the crowns of the teeth to be regulated. Having accomplished this, the

bar is placed and retained in position by passing one of the burnishers under the rings and drawing them forward and carrying each through the openings made by the file. A number of teeth can be acted on in this way at the same time; and as the fixture is easy of application, the patient or guardians may readily assist the operator by renewing the rings every day or two.

"In conclusion he would direct attention to the model in his hand, Fig. 19, in which it will be observed the right superior central incisor is considerably outside of the arch.

"This was accomplished by throwing an India-rubber ring around the incisor, and then stretching it over the crown of the first bicuspid of the same side. The contraction of the rubber in a few days drew it into place. To prevent the front teeth from striking during this period, silver caps were placed on the molars."

C. A. Kingsbury, in the same journal, p. 185, says, "The principal causes of irregularity of the teeth, as already stated, are hereditary and mechanical. I have met with a number of cases in my practice, where irregularity caused by a contracted alveolar arch existed in nearly every member of the same family, the predisposition being inherited from the mother. Within a few months past I have treated three cases within the same family. These cases, though quite different in form, and by no means equally bad, were all caused by malformation of the superior maxilla, of a congenital character, the impression being received from the maternal side.

"My method of treating such cases may differ in some respects from that of other members of the profession. When it is necessary to extract one or two bicuspid teeth to make room to bring the protruding cuspidati into their proper position, I invariably extract the second bicuspids unless the first are in a carious condition, or when being sound, they approximate so as to touch the lateral incisors. In such cases I extract the first instead of the second bicuspids.

"I take an accurate impression of the mouth, and fit a plate with as much care as if it were for an artificial denture, letting the plate for the superior teeth extend well back over the palatine surface, but not so far as to annoy the patient.

"I attach clasp and braces for the double purpose of firmly supporting the plate and preventing those teeth that are in proper position from being moved. If the occlusion is such that the inferior incisors, as is often the case, interfere with the regulation of the irregular teeth, I cap a molar on each side. I then, supposing the case to be one where the cuspidati stand outside of the regular curve of the superior maxilla, attach a small loop or ring of No. 20 wire to the palatine surface of the plate, at such point as the relative position of the teeth to be treated may indicate.

"By means of a gold spiral spring rather shorter than the distance between this ring and the tooth to be moved, one end of which is secured to the tooth by a silk ligature, and the other drawn back and hooked into the ring, a degree and kind of traction may be applied, best adapted to effect the desired object. A small strip of good gum elastic may be substituted for the spiral spring. But there is the disadvantage of its soon losing its elasticity and requiring frequent removal.

"The gum elastic rings made from tubing, so highly spoken of by some, have

never yet served me any good purpose. I have always found them to lack the elasticity and toughness of the ordinary dark-colored gum.

"In those cases where the superior incisors incline inward toward the palatine arch, and strike inside of the inferior, I resort to a device somewhat different from any that I have ever known to be used or described by any member of the profession. It may not, however, be new to others.

"Instead of applying a metallic bar upon the labial surface of the teeth, attaching its extremities by ligatures to the molars or bicuspid, as recommended by Fox and in frequent use by dentists, and then by means of ligatures passed around the teeth and fastened to this bar, drawing them into the desired positions, I adopt a very simple but most efficient appliance for accomplishing the same object. To such a plate as I have already described, I solder as many tubes or hollow cylinders as there are teeth to be regulated.

"These tubes are from four to five lines in length, and one and a half lines in diameter. Perhaps I can convey a more accurate idea, in the absence of a drawing, by their resemblance to an ordinary percussion cap, being open at one end, but rather longer, and of smaller diameter.

"These tubes are soldered to the plate with the open end facing the lingual surface of the teeth to be moved, and distant from them about two lines. Into these tubes are fitted small solid cylinders of wood, which serve as spurs to press upon the teeth. When applied, a small piece of ordinary gum elastic is put into the tubes, filling half their length. The small cylinders or spurs of wood are now inserted, so that when the fixture is adopted to the mouth, one end presses upon the gum-elastic, and the other upon the tooth, thus producing a uniform and persistent pressure.

"When a tooth requires to be turned upon its axis—as is often the case with the superior central incisors when they assume an oblique or diagonal position upon the alveolar arch—I attach a gold band to the tooth, so as to embrace it firmly. To this band on that side which is nearest the alveolar border, I attach a strip of gold, of such thickness and width as form an elastic spring, and long enough to reach to the first and second molars, to one of which the end of this is secured by a ligature.

"By this means a force is constantly applied in the direction I wish to move the tooth.

"Recently I have used the tube and cylinder wood to remedy this form of irregularity with so much success, that I am inclined to think they will entirely supersede the other appliance in my practice. While the spur of wood presses upon one side of the tooth to force it into its proper position, the other side is drawn in toward the plate or prevented from being moved anteriorly, as the case may require, by a ligature from that side to the gum plate."

(To be continued.)

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

JAMES DAVID MCCOY, D.D.S., EDITOR
LOS ANGELES, CALIF.

FRACTURES OF THE MANDIBLE

BY W. A. WILKINS, M.D.C.M., MONTREAL, CANADA.

Roentgenologist, Montreal General Hospital; Demonstrator of Roentgenology, McGill University; late Associate Roentgenologist, No. 3 Canadian General Hospital, British Expeditionary Force, France; Consulting Roentgenologist, "A" Unit, Canadian Hospitals Commissions.

ONE of my reasons for discussing such an elementary subject as fractures of the mandible is that it is elementary. In recent years, so many advances have been made in diagnosis and in treatment of more important subjects that reference is seldom made to less important ones. The very greatness of the strides which have been made merely serves to widen the breach, and render us liable to neglect the ordinary and commonplace. One hesitates to bring up old subjects; but I am of the opinion that no harm can result, and some good may come, if from time to time, we refresh our minds on subjects which are elementary. It is with this object in view that I write and not with the belief that I will be able to throw new light on an old matter. Moreover, fractures of the lower jaw are sufficiently common in hospital practice to merit an occasional word. They constitute approximately two per cent of all fractures coming to the x-ray department of the Montreal General Hospital. They are of special interest to the orthodontist, and, in fact, the keen interest, which the members of the dental department of our hospital have taken in these cases, has suggested the subject to me.

It is not my intention to speak about the treatment: but to restrict my remarks to the different varieties of fracture occurring in this bone, and to the diagnosis in general, illustrating with skiagrams of cases from our department; and endeavor to emphasize the aid that the roentgen examination can be in diagnosis, in indicating the line of treatment to be followed, or in observing the effect of the treatment adopted, and the results of Nature's effort to repair the injury.

Although the diagnosis, as a rule, is easily made without resorting to a roentgen examination, nevertheless, now and again, cases occur in which the diagnosis is made by it alone, especially is this the case in the rare condition of incomplete fracture. This occasional finding is by no means its only value. Its greatest value consists in "visualizing" the line of fracture on the x-ray plate, giving definite information concerning the extent of the fracture and the position of the fragments. It should be remembered, that a single x-ray plate

is merely a shadow in one plane, furnishing information concerning two dimensions; namely, length and breadth. By making a second plate at right angle to the first, another point of view is obtained, and the third dimension can be constructed. This method is seldom practicable in injuries of the jaw, but fortunately the stereoscopic method is available and the results obtained are all that could be desired. The line of fracture, the degree of separation, or displacement of the fragments can be ascertained readily. Films placed inside the



Fig. 1.

mouth, owing to their small size, convey little information concerning the fracture, but are invaluable when it is desired to know the condition of an individual tooth or of the bone in its immediate neighborhood. As a matter of practice, the placing of a film inside the mouth in a case of fracture of the jaw is a difficult proceeding. Frequently a tooth adjacent to the fracture is loosened, and often there is comminution of bone in this region. Small isolated fragments may remain for months, acting as foreign bodies and causing a slight discharge until

expelled or removed. In such cases, a small film may succeed in localizing the spot where a plate may fail. In Fig. 1, three small fragments can be seen behind the last molar tooth. Although a difficult area for a film, these fragments were seen much better on a film made at the same examination. This case is the same as Fig. 17, but made one month earlier.

It is readily understood how the exposed and unprotected position of the lower jaw renders it very liable to injury, and consequently it is more frequently fractured than any other bone of the face, except the nose. The force and



Fig. 2.

direction of the blow will largely determine the seat of the fracture, and there is another predisposing cause which has not received the attention it deserves; namely, conditions within the mouth at the time the injury is received. Foreign bodies between the teeth, such as a pipe, unquestionably affect the distribution of the force of the violence, fracture occurring at some point where the teeth are not in contact. Again, I have been impressed with the frequency with which fracture occurs in regions where the teeth are absent, and, therefore,

where the jaw is weakest. Fig. 2 is an example of this—a vertical fracture in an almost toothless jaw. The presence or absence of muscular contraction will also assist in determining the seat of fracture. A blow upon the jaw when the teeth are clinched is more likely to fracture the jaw at the point where the violence was applied—other things being equal—whereas, if the muscles are relaxed, or the mouth open, fracture of the base of the skull may occur.

Fracture from direct violence is the rule, the break occurring at the point where the force was applied. It may also result from indirect violence, as,



Fig. 3.

fracture of the condyle from a blow or fall upon the chin. Owing to occupation and habits, the jaw is more frequently fractured in males than in females. Age is a predisposing cause, and although the commonest period in my series was around 35 years, it is by no means unknown in childhood or old age. More than 90 per cent of my cases occurred between the ages of 18 and 45.

The situation of the fracture may be in the body, the ramus, or in the condyloid or coronoid processes. The commonest situation is in the body, and if

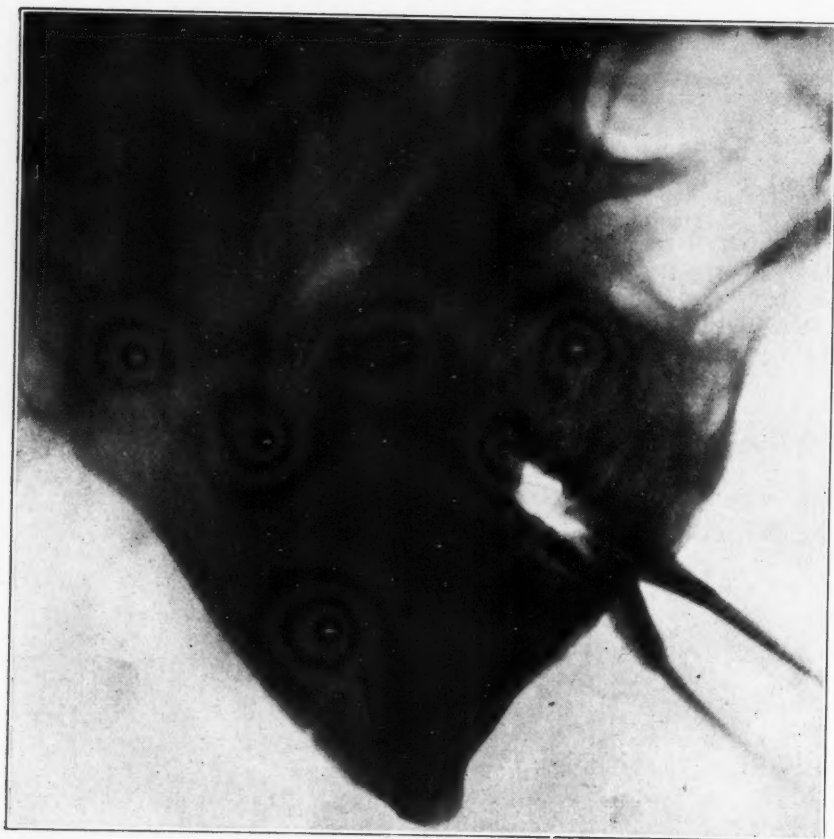


Fig. 4.



Fig. 5.

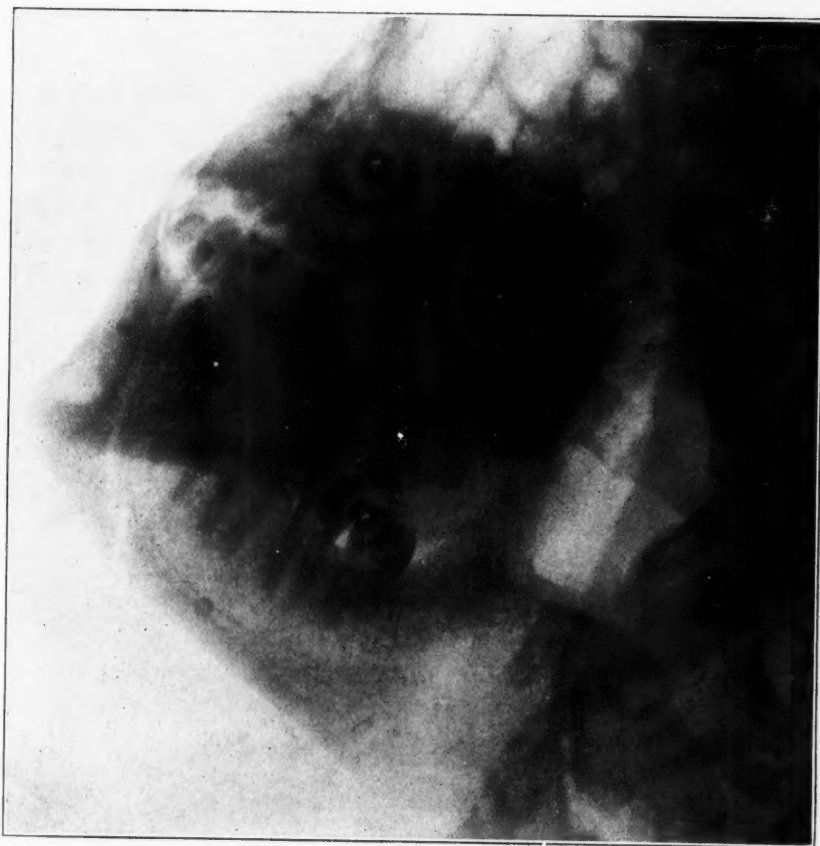


Fig. 6.



Fig. 7.

we exclude fractures of the alveolar border, such as occur during extraction, the favorite site is anteriorly, in the neighborhood of the canine tooth, the mental foramen or near the symphysis. It is also of common occurrence posteriorly, either through the angle of the jaw, or in the region of the last molar tooth. Fig. 3 is an example of a more or less vertical fracture just behind the mental foramen, and Fig. 4, just in front. Practically no separation is present. In Figs. 5, 6, and 7, the line of fracture is more anterior, and, in all three, the separation and displacement is the same, the anterior fragment being drawn



Fig. 8.

downward by the action of the geniohyoid, and geniohyoglossus, and the digastric. The first occurred in a child of 8 years, the second in a young man of 21, and the third in a youth of 18. An interesting side issue in these three cases is a comparison of the molar teeth. Fig. 8 is the same case as Fig. 5, two months later. The treatment has had little effect in correcting the deformity, but the callus which has been thrown out has bridged over the gap and rounded off the irregularity of the inferior border. Fig. 9 is a vertical fracture near the symphysis, reduced and held in place by a wire splint attached to the teeth.

In Figs. 10 and 11, the fracture line is behind the last molar tooth, vertical in the former and oblique in the latter. In both, the displacement is slight due to the action of the internal pterygoid and masseter muscles.

Fracture of the ramus alone is of far less frequent occurrence; of either the condyloid or coronoid processes, rare, and when present is generally found associated with fracture of some other bone of the face.

Regarding the direction of the line of fracture, the greatest number are



Fig. 9.

oblique, no matter where situated; many are vertical, and very few are transverse. No one type can be assigned to any one region, and, as a matter of fact, it is not essential. Roughly, one may say that the majority at the angle are oblique; in the middle of the body, vertical; and in the anterior portion, vertical or oblique. In the ramus they are generally oblique, but may be vertical or even transverse.

The displacement of the fragments may be upward or downward, backward, or forward, internal or external, or a mere separation with a gap



Fig. 10.



Fig. 11.

between the fragments. Generally there is a combination present. Displacement, as a rule, is more marked anteriorly, the difference in the level of the teeth being evident. The anterior fragment is drawn downward by the digastric, the geniohyoid and geniohyoglossus. Nearer the middle of the bone, the posterior fragment will be drawn upward by the action of the temporal muscle. At or near the angle, displacement is not the rule, owing to the action of the masseter and internal pterygoid muscles. If the fracture is through the neck of the condyle, the condyle will be drawn inward owing to the internal attachment of the external pterygoid. In this case, the chin points to the injured side.



Fig. 12.

In about two-thirds of the cases, the fracture is single; in the remaining one-third, the break may occur in two or more places. In the latter condition, it more than twice as often involves both sides, and the situation may be the same on each side. Multiple fractures on the same side only, are less frequent. Fig. 12 is an example of a double fracture involving both jaws. In one jaw, the fracture is oblique and near the middle line; in the other, it is through the ramus and more or less vertical—an unusual type for this region. In neither case is there much separation of the fragments. In Fig. 13, one fracture is vertical in the region of the canine tooth, and oblique through the angle of the

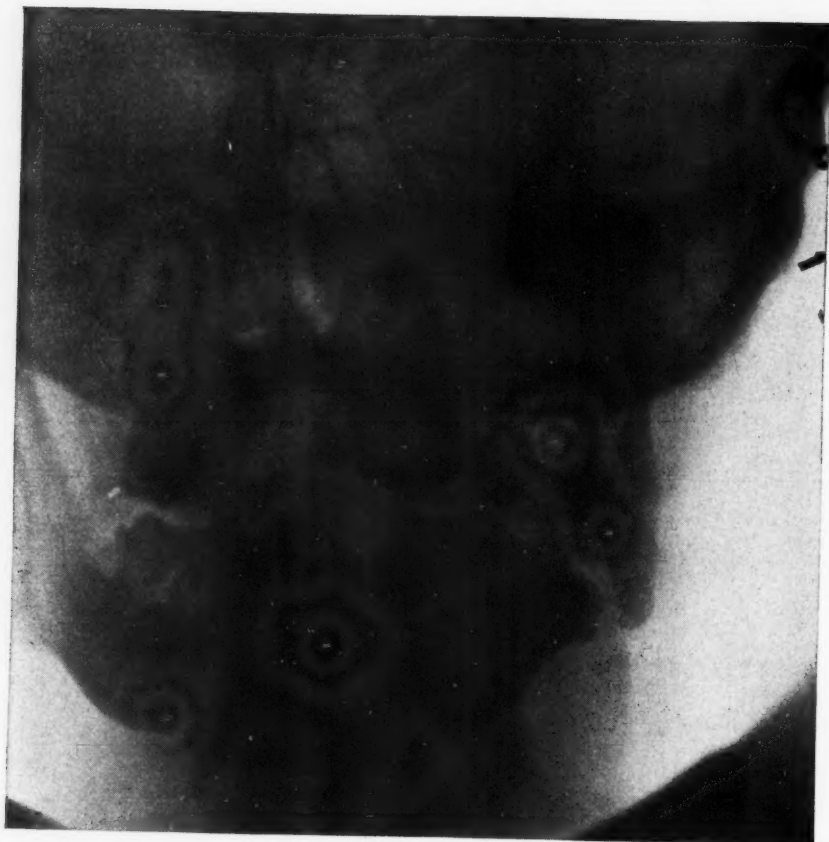


Fig. 13.



Fig. 14.



Fig. 15.

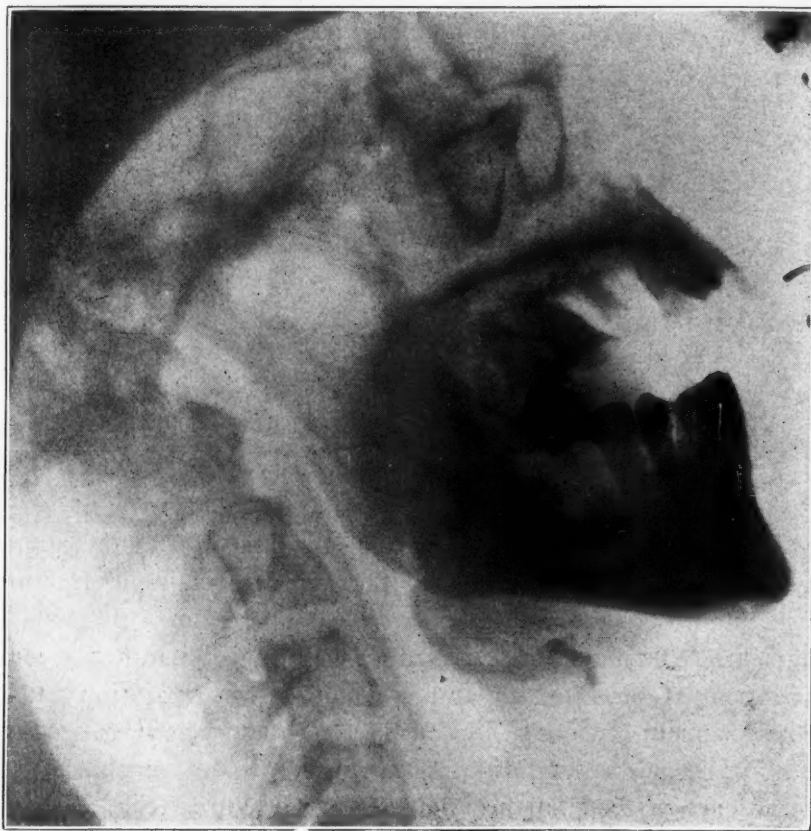


Fig. 16.

opposite side, with very marked separation. Fig. 14 illustrates a fracture through both jaws at the same level. Note the denture in the upper jaw, and the scarcity of teeth in the lower. This, no doubt, was a predisposing cause to fracture. Fig. 15 is an oblique view of an interesting case. Two fractures of the lower jaw are present, namely, vertical in front of the third molar—where the teeth are absent—and oblique near the symphysis. The upper and lower jaws are held together by means of a wire splint. A third fracture through the zygomatic process can be seen.

Comminuted fractures are regarded as being rare, except when result-



Fig. 17.

ing from severe crushing or gunshot injuries. This has not been my experience, for on the x-ray plate, many of the apparently simple fractures show small fragments of bone at either end of the fracture line. Fortunately these small fragments seldom give rise to trouble. Fig. 16, illustrates a comminuted fracture in front of the third molar tooth, with great separation and displacement of the fragments. Several loose fragments can be seen, two of which are large. The position of the third molar appears to be very insecure. Note again, the absence of teeth in the region of the fracture. Fig. 17 is a war injury. The bullet fractured both mandibles at the angle, only one of which

is shown in this view. This one is the wound of exit, and there has been a considerable loss of bone substance. There was marked comminution, and small fragments of bone were discharged for several months. This skiagram was made six months after the injury was received. Although there is loss of substance in the region of the last tooth, the tooth is not loose. Note the contact between the third and first molars, the second having been extracted many years previously. Figs. 18 and 19 are also skiagrams of another war injury,



Fig. 18.

being anteroposterior and lateral views of the same patient. The jaw has been fractured by a piece of shrapnel which has lodged in the cheek in the neighborhood of the third molar, where it can be felt. Considerable loss of substance has occurred, osteomyelitis is present and the loosened stump of the canine tooth as well as several loose fragments of bone can be made out. Two more very small pieces of shrapnel can be seen, one in the right cheek and the other

over the right frontal sinus. The fillings in the teeth must not be mistaken for shrapnel.

Compound fractures are very common, usually opening into the mouth, as a result of which they become septic. Less frequently, they open externally, due to the violence of the blow splitting open the soft tissues overlying the bone. Occasionally they are compound externally and internally. Incomplete fracture, apart from the alveolar border, is rare.



Fig. 19.

Although the x-ray examination is positive, and, in all cases, the final court of appeal during the lifetime of the patient; nevertheless, to yield to the temptation of utilizing this short cut to diagnosis as the only means of examination, eventually would be disastrous. The clinical signs and symptoms cannot be ignored. Deformity at the seat of the injury, abnormal mobility between the fragments, irregularity of the teeth, crepitus, pain increased by the movements of the jaw, and hemorrhage are the immediate signs. Swelling, internally and

externally, appears very quickly. The flow of saliva is not only increased, but swallowing is so difficult and painful that dribbling occurs. If compound internally, as is so frequently the case, suppuration more or less severe intervenes, the breath becomes very foul, and within a few days the glands of the neck enlarge.

The prognosis in fracture of the mandible is generally favorable. Union occurs within four to six weeks in uncomplicated cases. Failure of union is rare, unless there has been a considerable loss of bone substance. Danger to life is slight, unless injury to the brain results from the violence of the blow, or infection becomes beyond control. Persistence of a sinus usually means the presence of a small fragment—large fragments generally cause profuse discharge. To quote from Stimson, the probabilities are, "that union will take place promptly; that no serious complications will arise; and that no important deformity or disability will remain."

The question of treatment, I will leave for more capable hands. My prime object is an endeavor to illustrate the value that an x-ray examination can be in fractures of the mandible. It gives information, which, for exactness, can be exceeded only by the postmortem table. Fortunately the x-ray examination is part of the routine examination today for all fractures; and I do not imagine that any case of fracture of the mandible occurring within reach of an x-ray installation, escapes examination.

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EDITORIALS

Post-Graduate Courses in Dentistry at State Meetings

NOW that the time is approaching for state dental societies to hold their annual meetings, the post-graduate course is much in evidence.

There is much to be commended in this; and if the work undertaken is well planned and systematically carried out, great good comes to those who take the courses. Dental education is making such rapid and gigantic strides that one must be constantly on the alert for self-improvement, or be hopelessly relegated to the rear. The dentist who graduated ten or twelve years ago is at a disadvantage when compared with the graduate of today, and unless the graduate of former years bestirs himself, and by frequent post-graduate courses and special work, keeps abreast with the mental life of his profession, his position will soon be an unenviable one.

- Problems fraught with vital interest to the dentist are crowding hard upon his time for settlement. How best to fill root canals; how to read and inter-

pret dental radiographs; how to select and apply the best in mechanical dentistry, and at the same time know and understand physiological chemistry, physical diagnosis, and the factors entering into the cause of malocclusions; the best method for treating such conditions; these are some of the varied and far reaching problems that the dentist is called upon to solve.

Reading is undoubtedly the most universal method for obtaining knowledge, but reading *per se* is not the most efficient method to advance oneself mentally. Reading, observation, reflection, and practice, aided by the personal touch of the teacher, is undoubtedly the most efficient method in making mental progress; and of these four methods, the personal touch of the teacher is one of the most valuable. One reads, reflects, and puts into practical application what one learns from the textbook or the journal article, but still there hangs over one the air of uncertainty. But, let the teacher once point out the way, and everything is made clear. There is a power that goes with the spoken word that is lacking in the written page. The teacher clinches the point, drives home the argument, and so convinces, that one is able to more aptly apply information gained in this manner than in any other.

Another point in favor of the state post-graduate course is its cheapness. Where can a dentist take a course or get even one lecture on a special subject from an authoritative source for ten dollars? It cannot be done, but you can contribute this amount to the general fund that your state society is raising for this purpose and for four days you can enjoy a mental treat that will clear the cobwebs out of your brain and set your feet on solid rocks.

A state post-graduate course in dentistry is a great thing. It is a vast improvement over the old time state dental meeting dominated by the politicians of the state society that usually evolved itself into a mutual admiration society with little or no scientific value to it. The idea of two or more states uniting in this work is to be commended. Better and more talent can be secured in this manner, and a wider range of opinions can be centered upon the scientific problems in which the dentists are so vitally interested.

Blind Leaders of the Blind

ONE of the strongest and most suggestive editorials that has been published in a dental journal in many years appeared in the January, 1917, issue of *Oral Hygiene*. One is not given to expect great things editorially, from a journal of the *Oral Hygiene* type. But Jesus came out of the despised Nazareth, and surprises in journalism, as well as in politics, are not impossible.

It is said that the President of the New York Central Railroad, when Elbert Hubbard's immortal "Message to Garcia" was given birth, procured and sent a copy of it with his compliments to every employee—big, little, old, and young—in the service of the road of which he was president.

It would be more than philanthropy, it would be real "Simon pure" service if a copy of "Blind Leaders of the Blind" could be engraved on never-eroding parchment and given to every practicing dentist, every dental teacher, and every dental student in the United States of America.

The reading and frequent re-reading of this editorial might be the needed stimulus to bring about higher education and better prepared recruits in the dental profession. When one realizes that he is ignorant and illiterate, this knowledge is a stimulus to study in an effort to overcome this weakness. The hopeless individual is the one who is ignorant, but at the same time is too ignorant to realize it.

The person upon whose ears the message in "Blind Leaders of the Blind" should strike in thundering tones is the man who conducts the commercialized dental school, who cares nothing about the fitness of the matriculate to take up a professional career, and who looks upon the dentist as nothing more than a de luxe edition of the village plumber. To such an individual, the editorial "Blind Leaders of the Blind" should be repeated with all the solemnity of the Lord's Prayer, and it should be repeated morning, noon, and night until his craven soul sees the light of a great truth, and is born again.

Is it any wonder that the dental profession stands at the bottom in the list of the learned professions when one takes cognizance of the fact that no effort was made, until a few years ago, to select the material that made up its recruits, and that its leaders then were men with little or no special training in the work which they sought to perform?

Someone said, somewhere, sometime, that the dead past should bury its dead. Realizing that this is not bad philosophy, one is prone to draw the veil upon the mistakes and the short comings of dental teachings so prevalent in the past, but it is well in forgetting to look keenly into the future.

Why should the blind continue to lead the blind? Why should the unfit dental school continue to graduate the unfit, thus increasing their spawn to in turn reproduce more of their kind? Why not get leaders whose sight is unlimited and who are capable of a clear vision into the realm of science? There is not a state university in America but that is capable of maintaining a well equipped and well manned dental department with teachers who are not blind, who have more than a grammar school education, and who are capable of training dental students in such a manner that when they take upon themselves the duties of their profession they will reflect credit upon dental science and their Alma Mater.

Run such departments in close proximity to the medical departments of state universities in order that dental students may know and understand the intimate relationship between medicine and dentistry, thus narrowing the gulf between these two professions, and you will see, in time, a new order of things. You will see leaders spring up in dentistry with a clear vision, and you will see this great science come into its own, and bestow upon humanity the blessings of which it is capable.

The Open Door

ONE is quite apt to hear much said, and can read much that is written upon the democracy of science. We are told, and rightly so, that science recognizes no geographic boundaries, that the searcher for truth is glad to find it, in the workshops of either friend or foe.

Such a premise as the above can be rightfully applied to the genuine seeker for knowledge, but to the poser and the pseudoscientist this statement has little meaning. Truth is the common property of all, and he who seeks to hide its light from the world for personal gain is an enemy to progress, and a menace to the cause he has espoused.

It is said of liberty that many crimes have been committed in its name. The same is equally true of science. Behold the self-appointed gods in some of the many fields of human endeavor, blowing the trumpet of accomplishment, and expecting to see the servient knee of all its devotees bend to the ground; and unless the bending is in evidence, the fires of wrath are kindled and the unholy ones must be cast out into eternal darkness where, figuratively speaking, there is weeping and gnashing of teeth.

Such an attitude on the part of men is cause enough to elicit genuine pity for them. Pity that they are so far away from the goal they hope to reach, and pity that they can do damage to some with whom they are thrown in contact. Men of this type are known to all, and unfortunately they grace—more correctly speaking, disgrace—both the dental and the medical professions. The “holier than thou” attitude is assumed by them, and he who has the temerity to disagree with their conclusions in the realm of science is in danger of being crushed. This attitude is wrong, and no genuine scientist ever assumes it. Truth is big enough to encompass all. The man who genuinely seeks it has no time to waste in condemning the efforts of his fellow workers.

There is plenty of room in the realm of science for all, but there is no place in this realm for the individual who wants to usurp authority, decry the efforts of his co-workers, and stigmatize the results that others have secured through arduous toil.

There is too much to accomplish in dentistry and medicine to waste one's time and energy trying to placate, understand, or affiliate with the type that we have described. Like the biblical poor, they will always be with us. Let them bay at the moon, while the tried and genuine disciples of truth continue in their endeavor to open wider and still wider the door.

News and Notes

Dr. Robert W. Gaston announces the location of his offices at 1137 Maison Blanche Building, New Orleans, La., for the practice of orthodontia exclusively.

Dr. Rolof B. Stanley has removed his office to 8 East Fifty-fourth Street, New York City, for the exclusive practice of orthodontia.

Dr. John Lockhart Dudley announces his location in Buffalo at 722 Main Street, Ansonia Building, for the exclusive practice of orthodontia.

Dr. Walter Hyde, graduate of the School of Orthodontia of the Forsyth Infirmary for Children, announces the opening of his office at 603 Physicians and Surgeons Building, Minneapolis, Minn. Practice limited to orthodontia.

The Fifty-third Annual Meeting of the Massachusetts State Dental Society will be held on May 3, 4, and 5, 1917, at Springfield, Mass. J. Arthur Furbish, D.M.D., 400 Marlborough St., Boston, Mass., is the secretary.

Dr. Martin Dewey has announced his new location at 25 E. Washington St., Chicago, Ill. Orthodontia exclusively.

Brophy's New Book on Oral Surgery*

IT has been several years since there has been a contribution to dental literature of as much importance as Brophy's "Oral Surgery." There probably is no man in the dental profession as well fitted as is Dr. Brophy to write upon this subject. Long years of experience have enabled him to collect a wealth of data from interesting cases in practice which he has been able to use in the preparation of this work. Brophy's book is divided into two parts, the first of which deals with the principles of surgery, while the second is devoted to diseases, injuries, and abnormalities of the oral cavity and associated parts. In the first part, we have a general review of pathological conditions and diseases which affect the oral cavity: this necessarily is of interest to anyone who is interested in oral deformities. The second part deals with diseases and injuries, and the manner of treating them, and is especially interesting, as it contains, in detail, Dr. Brophy's technic of the operation for harelip and cleft palate; in fact, the entire surgery of the head and face is considered. The book is profusely illustrated, most of the illustrations having been made especially for this work. The close interest which exists between oral surgery and orthodontia makes Dr. Brophy's book a particularly valuable addition to the library of anyone practicing orthodontia.

*A Treatise on the surgical diseases, injuries and deformities of the mouth and associated parts. By Truman W. Brophy, M.D., D.D.S., LL.D., President and Professor of Oral Surgery and Dean of the Faculty, Chicago College of Dental Surgery. With special chapters by Matthew H. Cryer, M.D., G. Hudson-Makuen, M.D., William J. Younger, M.D., F. W. Belknap, M.D., Calvin S. Case, M.D., D.D.S. 909 Illustrations including 39 plates in colors. Octavo: 1106 pages. Cloth, \$10.00.